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# Technology Profiles
# Eleventh Edition

# Volume 3
# Measurement and Monitoring Program

National Risk Management Research Laboratory
Office of Research and Development
U.S. Environmental Protection Agency
Cincinnati, Ohio 45268

## NOTICE

The development of this document was funded by the U.S. Environmental Protection Agency (EPA) under Contract No. 68-W-01-032, Task Order 14, to Computer Sciences Corporation. The document was subjected to the Agency's administrative and peer review and was approved for publication as an EPA document. Mention of trade names or commercial products does not constitute endorsement or recommendation for use at any particular hazardous waste site.

## FOREWORD

The U.S. Environmental Protection Agency is charged by Congress with protecting the Nation's land, air, and water resources. Under a mandate of national environmental laws, the Agency strives to formulate and implement actions leading to a compatible balance between human activities and the ability of natural systems to support and nurture life. To meet this mandate, EPA's research program is providing data and technical support for solving environmental problems today and building a science knowledge base necessary to manage our ecological resources wisely, understand how pollutants affect our health, and prevent or reduce environmental risks in the future.

The National Risk Management Research Laboratory is the Agency's center for investigation of technological and management approaches for preventing and reducing risks from pollution that threatens human health and the environment. The focus of the Laboratory's research program is on methods and their cost-effectiveness for prevention and control of pollution to air, land, water, and subsurface resources; protection of water quality in public water systems; remediation of contaminated sites, sediments and ground water; prevention and control of indoor air pollution; and restoration of ecosystems, NRMRL, collaborates with both public and private sector partners to foster technologies that reduce the cost of compliance and to anticipate emerging problems. NRMRL's research provides solutions to environmental problems by developing and promoting technologies that protect and improve the environment; advancing scientific and engineering information to support regulatory and policy decisions, and providing the technical support and information transfer to ensure implementation of environmental regulations and strategies at the national, state, and community levels.

This publication has been produced as part of the Laboratory's strategic long-term research plan. It is published and made available by the EPA's Office of Research and Development to assist the user community and to link researchers with their clients.

Hugh W. McKinnon, Director
National Risk Management Research Laboratory

## ABSTRACT

The Superfund Innovative Technology Evaluation (SITE) Program, now in its sixteenth year is an integral part of EPA's research into alternative cleanup methods for hazardous waste sites around the nation. The SITE Program was created to encourage the development and routine use of innovative treatment and monitoring and measurement technologies. Under the program, EPA enters into cooperative agreements with technology developers. These developers research and refine their innovative technologies at bench- or pilot-scale and then, with EPA's support, demonstrate them at hazardous waste sites. As a result, the SITE Program provides environmental decision-makers with data on new, viable treatment technologies that may have performance or cost advantages compared to traditional treatment technologies.

This document is intended as a reference guide for those interested in technologies participating in the SITE Demonstration, Emerging Technology, and Measurement and Monitoring Programs. The two-page profiles are organized into two sections for each program, completed and ongoing projects, and are presented in alphabetical order by developer name. Reference tables for SITE Program participants precede the sections and contain EPA and developer contacts. Inquiries about a SITE technology evaluation or the SITE Program should be directed to the specific EPA project manager; inquiries on the technology process should be directed to the specific technology developer.

Each technology profile contains (1) a technology developer and process name, (2) a technology description, including a schematic diagram or photograph of the process, (3) a discussion of waste applicability, (4) a project status report, and (5) EPA project manager and technology developer contacts. The profiles also include summaries of demonstration results, if available. The technology description and waste applicability sections are written by the developer. EPA prepares the status and demonstration results sections.

A Trade Name Index and Applicability Index are also included in the back of this document. The Applicability Index is organized by 11 media categories, 19 waste categories, and 14 technology categories.

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## ACKNOWLEDGMENTS

The project manager responsible for the preparation of this document is Teri Richardson of EPA's National Risk Management Research Laboratory in Cincinnati, Ohio. This document was prepared under the direction of Robert Olexsey, Director of the Land Remediation and Pollution Control Division. Key program area contributors for EPA include Annette Gatchett, and Randy Parker. Special acknowledgment is given to the individual EPA SITE project managers and technology developers who provided guidance and technical support.

Computer Sciences Corporation prepared this document under the direction and coordination of Teri Richardson and Annette Gatchett.

## SITE PROGRAM DESCRIPTION

The U.S. Environmental Protection Agency's (EPA) Superfund Innovative Technology Evaluation (SITE) Program, now in its sixteenth year, encourages the development and implementation of (1) innovative treatment technologies for hazardous waste site remediation, and (2) characterization and monitoring technologies for evaluating the nature and extent of hazardous waste site contamination.

The SITE Program was established by EPA's Office of Solid Waste and Emergency Response (OSWER) and the Office of Research and Development (ORD) in response to the 1986 Superfund Amendments and Reauthorization Act (SARA), which recognized a need for an "Alternative or Innovative Treatment Technology Research and Demonstration Program." The SITE Program is administered by ORD's National Risk Management Research Laboratory (NRMRL), headquartered in Cincinnati, Ohio.

The SITE Program includes the following key elements:

- **Demonstration Program** - Conducts and evaluates demonstrations of promising innovative technologies to provide reliable performance, cost, and applicability information for site cleanup decision-making

- **Emerging Technology Program** - Support of the Emerging Technology Program ended in 1998 after completion of all committed projects in the Program

- **Monitoring and Measurement Technologies** - Evaluates technologies that detect, monitor, and measure hazardous and toxic substances to provide better, faster, and more cost-effective methods for producing real-time data during site characterization and remediation

- **Information Transfer Activities** - Disseminates technical information, including engineering, performance, and cost data, on innovative technologies to remove impediments for using innovative technologies

This Technology Profiles document describes completed and ongoing projects in the Demonstration, Emerging Technology, and Characterization and Monitoring Programs. Figure 1 shows the relationship among the programs and depicts the process of technology development from initial concept to commercial use.

In the Demonstration Program, the technology is field-tested on hazardous waste materials. Engineering and cost data are gathered on the innovative technology so that potential users can assess the technology's applicability to a particular site. Data collected during the field demonstration are used to assess the performance of the technology, the potential need for pre- and post-processing of the waste, applicable types of wastes and waste matrices, potential operating problems, and approximate capital and operating costs.

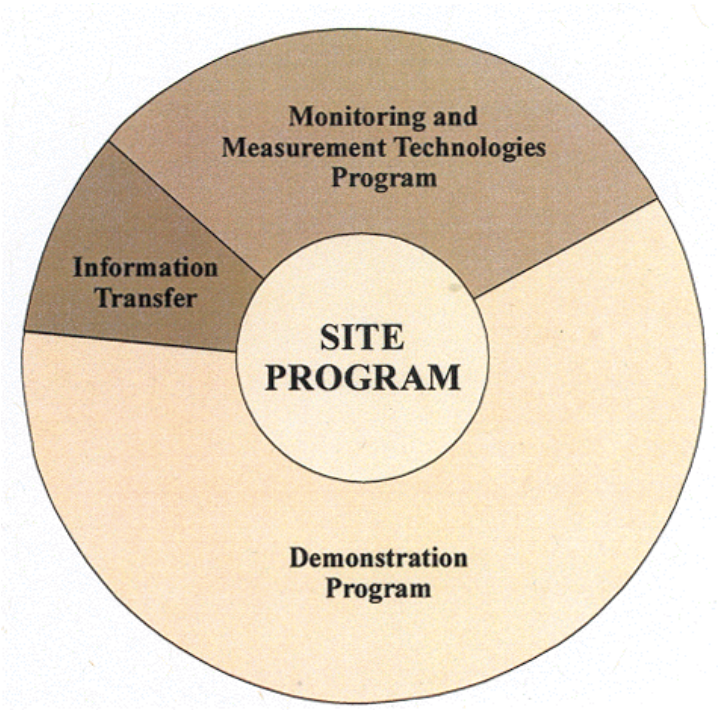



**Figure 1** *Development of Innovative Technologies*

At the conclusion of a SITE demonstration, EPA prepares an Innovative Technology Evaluation Report (ITER), Technology Capsule, and Demonstration Bulletin. Often, a videotape of the demonstration is also prepared. These reports evaluate all available information on the technology and analyze its overall applicability to other site characteristics, waste types, and waste matrices. Testing procedures, performance and cost data, and quality assurance and quality control standards are also presented. These demonstration documents are distributed by EPA to provide reliable technical data for environmental decision-making and to promote the technology's commercial use.

The Demonstration Program currently as 147 program participants conducting 141 demonstrations. Of these projects 128 demonstrations are complete and 13 are ongoing. The projects are divided into the following categories: thermal treatment (34), biological degradation (28), physical/chemical treatment (50), solidification/stabilization (13), phytoremediation (5), soil washing (4), materials handling (3), and other (4). Several technologies represent more than one treatment category.

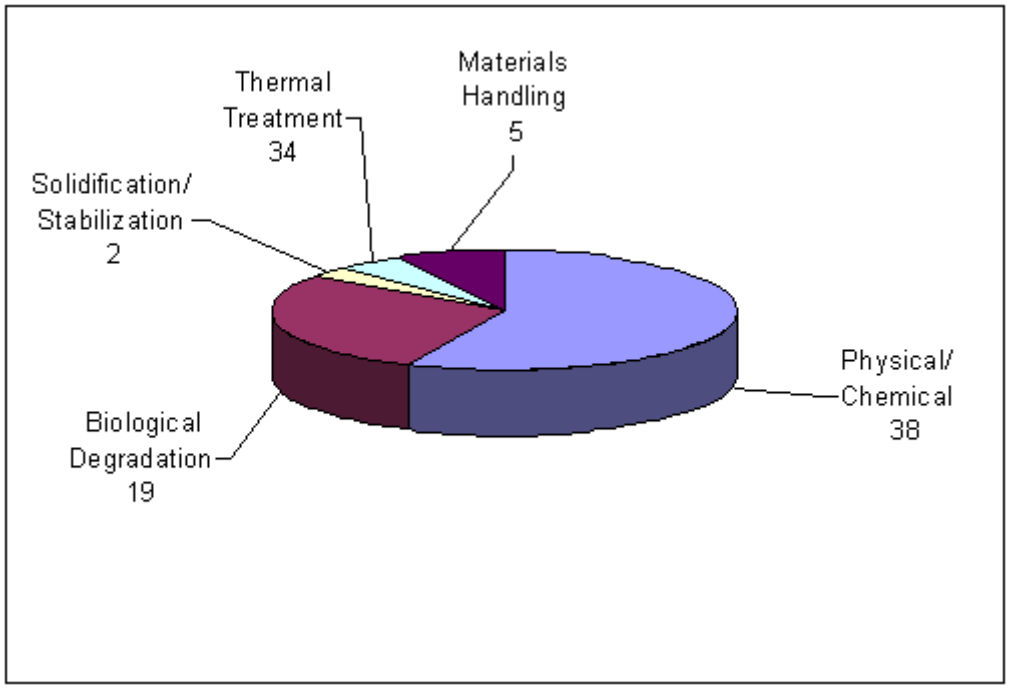
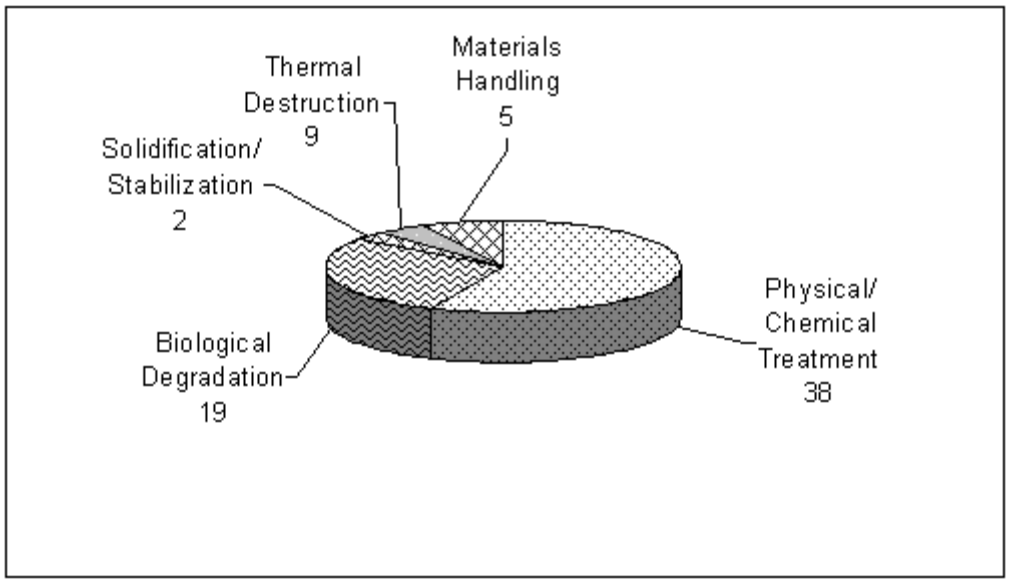



Figure 2 shows the breakdown of technologies in the Demonstration Program. Profiles for technologies demonstrated under the Demonstration Program are located in Volume I.

EPA has provided technical and financial support to 77 projects in the Emerging Technology Program. Seventy-three are completed and four have exited the program. Eighteen Emerging Technology Program projects participated in the Demonstration Program. The seventh-three active technologies are divided into the following categories: thermal destruction (9), physical/chemical treatment (38), biological degradation (19), solidification/stabilization (2), and materials handling (5). Figure 3 displays the breakdown of technologies in the Emerging Technology Program. Profiles for technologies demonstrated under the Emerging Technology Program are located in Volume II.




The Monitoring and Measurement Technologies (MMT) Program's goal is to assess innovative and alternative monitoring, measurement, and site characterization technologies. To date, 38 technology demonstrations have occurred under the MMT Program. These demonstrations have included four cone penetrometers, 6 field portable X-ray fluorescence units, 6 portable gas chromatographs, 4 spectrophotometers, 12 field test kits, and 6 soil samplers. Profiles for technologies demonstrated under the MMT Program are located in Volume III.

In the Technology Transfer Program, technical information on innovative technologies in the Demonstration Program, Emerging Technology Program, and MMT Program is disseminated to increase the awareness and promote the use of innovative technologies for assessment and remediation at Superfund sites. The goal of technology transfer activities is to promote communication among individuals requiring current technical information for conducting site investigations and cleanups.

The Technology Transfer Program reaches the environmental community through many media, including:

- Program-specific regional, state, and industry brochures
- On-site Visitors' Days during SITE demonstrations
- Demonstration videotapes
- Project-specific fact sheets to comply with site community relations plans
- ITERs, Demonstration Bulletins, Technology Capsules, and Project Summaries
- The SITE Exhibit, displayed nationwide and internationally at conferences

- Networking through forums, associations, regions, and states
- Technical assistance to regions, states, and remediation cleanup contractors

SITE information including an electronic version of this document, is available through the following on-line information clearinghouses:

SITE Program Home Page: *http://www.epa.gov/ORD/SITE*

Cleanup Information Bulletin Board System (CLU-IN)
Help Desk: 301-589-8368; Internet Access: *http://www.clu-in.org*

Technical reports may be obtained by calling the National Service Center for Environmental Publications in Cincinnati, Ohio. To find out about newly published documents or to be placed on the SITE mailing list, call or write to:

USEPA/NSCEP
P. O. Box 42419
Cincinnati, OH 45242-2419
1-800-490-9198

## SITE PROGRAM CONTACTS

The SITE Program is administered by EPA's Office of Research and Development (ORD), specifically the National Risk Management Research Laboratory (NRMRL). For further information on the SITE Program or its component programs contact:

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Fax: 513-569-7676

# Table 4
## Completed SITE Monitoring and Measurement Technologies Program Projects as of September 2002

| Developer | Technology | Technology Contact | EPA Project Manager | Applicable Media | Applicable Waste | |
|---|---|---|---|---|---|---|
| | | | | | Inorganic | Organic |
| **Analytical and Remedial Technology, Inc.** Menlo Park, CA | Automated Sampling and Analytical Platform | Doug McKay 415-324-2259 | Stephen Billets 702-798-2232 | Aqueous Samples | Nonspecific Inorganics | VOCs, PAHs, Ionizable Organics |
| **Aquatic Research Instruments** Lemhi, ID | Sediment Core Sampler | Will Young 208-756-8433 | Stephen Billets 702-798-2232 | Sediments | Not Applicable | Not Applicable |
| **Art's Manufacturing and Supply** American Falls, ID | AMS™ Dual-Tube Liner Soil Sampler | Brian Anderson 800-635-7330 | Stephen Billets 702-798-2232 | Soil | Metals, General Minerals | VOCs, SVOCs, Pesticides |
| **Art's Manufacturing and Supply** American Falls, ID | Sediment Core Sampler | Brian Anderson 800-635-7330 | Stephen Billets 702-798-2232 | Soil | Not Applicable | Note Applicable |
| **BioNebraska, Inc.** Lincoln, NE | BiMelyze® Mercury Immunoassy | Randy Carlson 800-786-2580 ext. 221 | Jeannette Van Emon 702-798-2154 | Soil, Sediments | Mercury | Not Applicable |
| **Bruker Analytical Systems, Inc.** Billerica, MA | Mobile Environmental Monitor | Paul Kowalski 506-667-9580 | Stephen Billets 702-798-2232 | Air Streams, Water, Soil, Sludge, Sediment | Not Applicable | VOCs, SVOCs, PCBs, PAHs |
| **CHEMetrics, Inc.** Calverton, VA | RemediAid™ | Joanne Carpenter 540-788-9026 | Stephen Billets 702-798-2232 | Soil | Not Applicable, | Aromatic Hydrocarbons, Gasoline, Diesel, Petroleum Products |
| **Clements, Inc.** Newton, IA | JMC Environmentalist's Subsoil Probe | Jim Clements 515-792-8285 | Stephen Billets 702-798-2232 | Soil, Sediment | Radionuclides, Metals | VOCs, PCBs, PAHs, Pesticides |
| **Dexsil Corporation** Hamden, CT | Emulsion Turbidimetry | Dr. Ted B. Lynn 203-288-3509 | Stephen Billets 702-798-2232 | Soil | Not Applicable | TPH |
| **Dexsil Corporation** Hamden, CT | Environmental Test Kits | Dr. Ted B. Lynn 203-288-3509 | Jeannette Van Emon 702-798-2154 | Soil, Sediment, Transformer Oils | Not Applicable | PCBs |
| **Edax Portable Products Division** Kennewick, WA | Metal Analysis Probe (MAP®) Specrum Assayer | Therese Howe 800-466-5323 or 509-783-9850 | Stephen Billets 702-798-2232 | Soil, Sediments | Metals, Lead, Radionuclides | Not Applicable |
| **Environmental System Corporation** Knoxville, TN | Ultraviolet Fluorescence Spectroscopy | Dr. George Hyfantis 865-688-7900 | Stephen Billets 702-798-2232 | Soil | Not Applicable | TPH |

## TABLE 4 (Continued)
## Completed SITE Monitoring and Measurement Technologies Program Projects as of September 2002

| Developer | Technology | Technology Contact | EPA Project Manager | Applicable Media | Applicable Waste | |
|---|---|---|---|---|---|---|
| | | | | | Inorganic | Organic |
| **Environmental Technologies Group, Inc.** Norcross, GA | AirSentry Fourier Transform Infrared Spectrometer | Orman Simpson 404-242-0977 | William McClenny 919-541-3158 | Air Streams | Nonspecific Inorganics | Nonspecific Organics |
| **Fugro Geosciences, Inc.** (formerly Loral Corporation) Houston, TX | Rapid Optical Screening Tool | Mary Mason 713-778-5580 | Eric Koglin 702-798-2432 | Soil | Not Applicable | Petroleum, PAHs, VOCs |
| **Geoprobe Systems** Salina, KS | Geoprobe Soil Conductivity Sensor | Wesley McCall 785-825-1842 | Stephen Billets 702-798-2232 | Soil, Rock, Hydrogeologic Fluids | Nonspecific Inorganics | Nonspecific Organics |
| **Geoprobe Systems** Salina, KS | Large Bore Soil Sampler | Wesley McCall or Tom Omli 913-825-1842 | Stephen Billets 702-798-2232 | Soil | Metals | Herbicides, Pesticides, PCBs, SVOCs, VOC Fuels, Dioxins, Furans |
| **Graseby Ionics, Ltd., and PCP, Inc.** Watford, Hertsfordshire, England West Palm Beach, FL | Ion Mobility Spectrometry | John Brokenshire 011-44-1923-816166 Robert Stimac Or William Kay 561-686-5185 | Eric Koglin 702-798-2432 | Air Streams, Vapor, Soil, Water | Not Applicable | VOCs |
| **Hanby Environmental Laboratory Procedures, Inc.** Houston, TX | Test Kits for Organic Contaminants in Soil and Water | John Hanby 512-847-1212 | Jeanette Van Emon 702-798-2154 | Soil, Water | Not Applicable | PCP, PAHs, Other Various Organics |
| **Hewlett-Packard Company** Wilmington, DE | Portable Gas Analyzer/HP Micro GC | Bob Belair 302-633-8487 or 800-227-9770 | Richard Berkley 919-541-2439 | Gas, Air, Ground Water | Not Applicable | VOCs, Naphthalene, Hexachlorobutadien |
| **HNU Systems, Inc.** Highlands, MA | HNU GC 311D Portable Gas Chromatograph | Jennifer Driscoll 617-964-6690 | Eric Kogin 702-798-2432 | Air Streams | Not Applicable | VOCs, Aromatic Compounds, Halocarbons, PCBs |

## TABLE 4 (Continued)
## Completed SITE Monitoring and Measurement Technologies Program Projects as of September 2002

| Developer | Technology | Technology Contact | EPA Project Manager | Applicable Media | Applicable Waste | |
|---|---|---|---|---|---|---|
| | | | | | Inorganic | Organic |
| **HNU Systems, Inc.**<br>Highlands, MA | HNU Source Excited Fluorescence Analyzer-Portable (SEFA-P) X-Ray Fluorescence Analyzer | Jennifer Driscoll<br>617-964-6690 | Stephen Billets<br>702-798-2232 | Solids, Liquids, Slurries, Powders | Metals | Not Applicable |
| **Horiba Instruments, Inc.**<br>Irvine, CA | Infrared Analysis | Jim Vance<br>800-4HORBIA<br>ext. 170 | Stephen Billets<br>702-798-2232 | Waste Water | Not Applicable | Oils |
| **Idetek, Inc.**<br>(formerly Binax Corporation, Antox Division)<br>Sunnyvale, CA | Equate® Immunoassay | Richard Lankow<br>408-752-1353 | Jeanette Van Emon<br>702-798-2154 | Water | Not Applicable | Benzene, Toluene, Xylene |
| **Metorex, Inc.**<br>Ewing, NJ | Field Portable X-Ray Fluorescence Analyzers | John Pattersonn<br>800-229-9209 | Stephen Billets<br>702-798-2232 | Soil, Water | Metals | Not Applicable |
| **Microsensor Systems, Incorporated**<br>Bowling Green, KY | MSI-301A Vapor Monitor | Norman Davis<br>207-745-0099 | Richard Berkley<br>919-541-2439 | Air Streams | Not Applicable | VOCs |
| **Millipore Corporation**<br>Bedford, MA | EnviroGard™ PCP Immunoassay Test Kit | Barbara Young<br>617-533-5207 | Jeanette Van Emon<br>702-798-2154 | Soil, Sediment | Not Applicable | PCBs |
| **NITON Corporation**<br>Billerica, MA | XL Spectrum Analyzer | Jonathan Shein<br>978-670-7460 | Stephen Billets<br>702-798-2232 | Soil | Metals | Not Applicable |
| **PE Photovac International, Inc.**<br>(formerly Photovac International, Inc.)<br>Sheton, CT | PE Photovac Voyager Portable Gas Chromatograph | Ed Chaissen<br>203-925-4600 | Eric Koglin<br>702-798-2432 | Air Streams | Not Applicable | VOCs |
| **Quadrel Services, Inc.**<br>Clarksburg, MD | Emflux® Soil-Gas Survey System | Bruce Tucker or Paul Hnning<br>301-874-5510 | Stephen Billets<br>702-798-2232 | Air, Ground Water, Soil | Not Applicable | VOCs, SVOCs |
| **Radiometer American**<br>Westlake, OH | Anodic Stripping Voltammetry for Mercury in Soil | Mark Nighman<br>800-998-8110<br>ext. 213 | Jeanette Van Emon<br>702-798-2154 | Soil, Sediments | Mercury | Not Applicable |

## TABLE 4 (Continued)
## Completed SITE Monitoring and Measurement Technologies Program Projects as of September 2002

| Developer | Technology | Technology Contact | EPA Project Manager | Applicable Media | Applicable Waste | |
|---|---|---|---|---|---|---|
| | | | | | Inorganic | Organic |
| **SCITEC Corporation**<br>Kennewick, WA | Metal Analysis Probe (MAP®) Portable Assayer | Steve Santy<br>800-466-5323<br>509-783-9850 | Stephen Billets<br>702-798-2232 | Soil, Sediment, Filter and Wipe Samples | Nonspecific Metals, Lead | Not Applicable |
| **Sentex Sensing Technology, Inc.**<br>Fairfield, NJ | Scentograph Plus II Portable Gas Chromatograph | Amos Linenberg<br>201-945-3694 | Eric Koglin<br>702-798-2432 | Air Streams | Not Applicable | VOCs |
| **Simuprobe® Technologies, Inc.**<br>Novato, CA | Core Barrel Soil Sampler | Dr. Richard Layton<br>800-553-1755 | Stephen Billets<br>702-798-2232 | Soil | Metals, General Mineral | VOCs, SVOCs, Pesticides |
| **SiteLab Corporation**<br>Hanover, NH | Ultraviolet Fluorescence Spectrometer | Steve Greason<br>603-643-7800 | Stephen Billets<br>702-798-2232 | Gas, Air | Not Applicable | TPHs,PAHs, BTEXs, PCBs |
| **Space and Naval Warfare Systems Center**<br>San Diego, CA | SCAPS Cone Penetrometer | Dr. Stephen Lieberman<br>619-553-2778 | Bob Lien<br>513-569-7443 | Soil | Not Applicable | Petroleum Hydrocarbons |
| **SRI Instruments**<br>Torrance, CA | Compact Gas Chromatograph | Douglas Gavilanes<br>310-214-5092 | Richard Berkley<br>919-541-2439 | Air Streams, Soil, Water | Not Applicable | VOCs, BTEX, PCBs, Pesticides |
| **Strategic Diagnostics, Inc.**<br>Newark, DE | EnviroGard™ PCB Immunoassay Test Kit | Joseph Dautlick<br>800-544-8881<br>ext. 222 | Stephen Billets<br>702-798-2232<br>Jeanette Van Emon<br>702-798-2154 | Soil, Sediments | Not Applicable | PCBs |
| **Strategic Diagnostics, Inc.**<br>(formerly EnSys Environmental Products, Inc.)<br>Newtown, PA | EnSys Penta Test System | Tim Lawruk<br>800-544-8881<br>302-456-6789 | Jeanette Van Emon<br>702-798-2154 | Soil, Water | Not Applicable | PCP |
| **Strategic Diagnostics, Inc.**<br>Newark, DE | Immunoassay and Colorimetry | Joseph Dautlick<br>800-544-8881<br>ext. 222 | Stephen Billets<br>702-798-2232 | Soil | Not Applicable | Petroleum Hydrocarbons |
| **Strategic Diagnostics, Inc.**<br>(formerly Ohmicron Corporation)<br>Newark, DE | RaPID Assay® | Craig Kostyshyn<br>302-546-6789 | Jeanette Van Emon<br>702-798-2154 | Soil, Water | Not Applicable | PCP |

## TABLE 4 (Continued)
## Completed SITE Monitoring and Measurement Technologies Program Projects as of September 2002

| Developer | Technology | Technology Contact | EPA Project Manager | Applicable Media | Applicable Waste | |
|---|---|---|---|---|---|---|
| | | | | | Inorganic | Organic |
| **Thermo Noran** (formerly TN Spectrace) Round Rock, TX | TN 9000 and TN Pb X-Ray Fluorescence Analyzers | Dan Polakowski 815-455-8459 | Stephen Billets 702-798-2232 | Soil, Sediment, Filter and Wipe Samples | Metals, Lead | Not Applicable |
| **Tri-Services** Aberdeen Proving Ground, MD | Site Characterization and Analysis Penetrometer System (SCAPS) | George Robitaille 410-612-6865 John Ballard 601-634-2446 | Stephen Billets 702-798-2232 | Soil | Not Applicable | Petroleum, PAHs, VOCs |
| **United States Environmental Protection Agency** Washington, D.C. | Field Analytical Screening Program-PCB Method | Howard Fribush 703-603-8831 | Eric Koglin 702-798-2154 | Soil, Water | Not Applicable | PCBs |
| **W.L. Gore and Associates, Inc.** Elkton, MD | GORE-SORBER® Screening Survey | Mark Wrigley 410-392-7600 | Stephen Billets 702-798-2232 | Soil, Ground Water | Not Applicable | SVOCs, VOCs, PAHs, Halogenated Solvents |
| **Wilks Enterprise, Inc.** South Norwalk, CT | Infrared Analysis | Sandy Rintoul 203-855-9136 | Stephen Billets 702-798-2232 | Soil, Liquids | Not Applicable | Oils, Grease, TPH |
| **XonTech Incorporated** Van Nuys, CA | XonTech Sector Sampler | Matt Young 818-787-7380 | William McClenny 919-541-3158 | Air Streams | Not Applicable | VOCs |

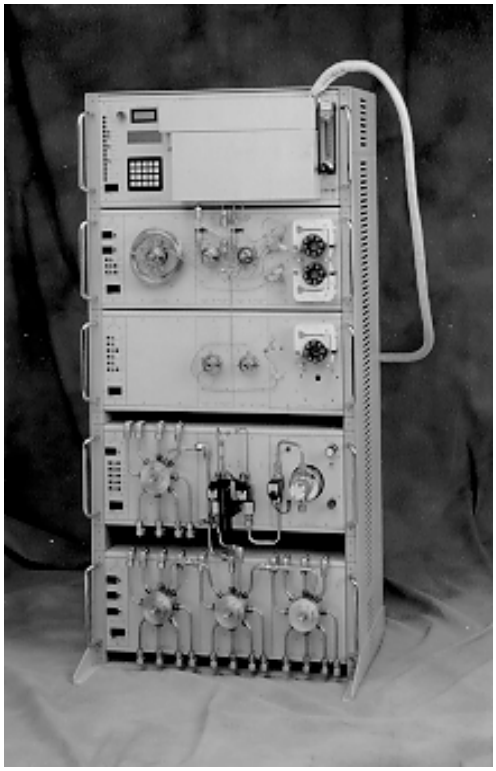
# ANALYTICAL AND REMEDIAL TECHNOLOGY, INC.

(Automated Sampling and Analytical Platform)

## TECHNOLOGY DESCRIPTION:

Analytical and Remedial Technology, Inc. ($A^+RT$), produces components that can be assembled in various configurations to allow automated sampling and analysis of water streams. The $A^+RT$ components are mounted in a custom case to produce an automated sampling and analytical platform (ASAP). A complete ASAP system consists of the following basic components:

- An ASAP sampling manifold module with internal pump
- An optional module to allow the ASAP to control up to 48 Grundfos 2-inch submersible pumps
- One or more ASAP sample preparation modules
- One or more third-party gas or liquid chromatographs with appropriate detectors
- One or more third-party integrators for processing raw data and producing hard copies of chromatograms
- A Windows 3.X-compatible microcomputer running $A^+RT$ software to control the system, store results in a database, and provide telecommunication capabilities.



Sampling and Analytical Platform

The photograph below illustrates an ASAP configured for automated sampling of 29 points using 0.25-inch stainless steel tubing.

The $A^+RT$ purge-and-trap concentrator draws a precise volume of water (selectable from 0.2 to 10 milliliters) from the selected sample stream and prepares it for volatile organic compound (VOC) analysis using a gas chromatograph. The $A^+RT$ concentrator differs from the customary batch purging approach in that it uses a flow-through, countercurrent stripping cell.

The $A^+RT$ high performance liquid chromatograph (HPLC) sample preparation module collects a sample in a fixed volume loop and delivers it to the HPLC. With additional components, the module can support a second channel for HPLC analysis along with either automated or manual sample selection. The module can also be configured to process the samples using solid-phase extraction. This process concentrates analytes, which are then backflushed with solvent and extracted for subsequent HPLC analysis.

An optional Grundfos pump interface module (GPIM) allows the ASAP, for a given sample, to select and operate one of up to 48 Grundfos RediFlo-2™ 2-inch submersible pumps connected to the ASAP. Thus, this module allows automatic sampling of groundwater for groundwater depths greater than 15 to 20 feet below surface. Control of up to 48 pumps requires only one Grundfos MP1 controller interfaced with the GPIM.

The $A^+RT$ components and software are designed to allow continuous (24-hour) monitoring for long periods of time (months to years) with automated continuing calibration checks and recalibration when necessary. The ASAP is designed to be installed with the other system components permanently or semipermanently in a secure, temperature-controlled space on site.

## WASTE APPLICABILITY:

The ASAP is designed for automated sampling and analysis of aqueous samples, such as those obtained from a treatment or process stream or from wells emplaced in a groundwater contaminant plume. The ASAP can be configured for a wide variety of contaminants, including VOCs, polynuclear aromatic hydrocarbons, ionizable organic chemicals, and a range of inorganic substances.

## STATUS:

Several commercial ASAP systems have been purchased by universities for use in groundwater remediation research at U.S. Department of Defense facilities. The ASAP has considerably broader capabilities than the prototype system (the Automated Volatile Organics Analytical System, or AVOAS) evaluated under the SITE Program. The AVOAS was demonstrated in May 1991 at the Wells G and H Superfund site in EPA Region 1. The results of the demonstration have been published by EPA ("Automated On-Site Measurement of Volatile Organics in Water, EPA/600/R-93/109, June 1993").

## FOR FURTHER INFORMATION:

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Menlo Park, CA 94025
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# AQUATIC RESEARCH INSTRUMENTS

(Sediment Core Sampler)

## TECHNOLOGY DESCRIPTION:

The Russian Peat Borer is a manually driven, chambered-type, side-filling core sampler designed to collect discrete, relatively uncompressed sediment samples. Sampler components include a stainless-steel core tube, aluminum extension rods, a stainless-steel turning handle, and a Delrin core head and bottom point that support a stainless-steel cover plate. The cover plate and bottom point are sharpened to minimize sediment disturbance during sampler deployment. The core tube is hinged to the cover plate by two pivot pins at the top and bottom of the plate. Support equipment for the sampler may include a slide-hammer mechanism to aid sampler deployment and retrieval in consolidated sediment. To collect a sediment sample, the Russian Peat Borer is manually inserted into sediment, and the core tube is turned 180 degrees clockwise. This procedure allows the core tube to rotate and its sharp edge to longitudinally cut through the sediment, collecting a semi cylindrical sediment core. While the core tube is manually turned, the stainless-steel cover plate provides support so that the collected material is retained in the core tube.

## WASTE APPLICABILITY:

The Russian Peat Borer is a manually driven core sampler designed to consistently collect uncompressed samples of bog and marsh sediment. The sampler is designed to operate in shallow water (a depth of up to 15 feet) and to achieve complete sediment profile collection to a maximum depth of 65 feet bss (below sediment surface), depending on the sediment thickness.

## STATUS:

In April and May 1999, the EPA conducted a field demonstration of the Russian Peat Borer along with one other sediment sampler. It was demonstrated at sites in EPA Regions 1 and 5. At the Region 1 site, the sampler was demonstrated in a lake and wetland. At the Region 5 site, the sampler was demonstrated in a river mouth and freshwater bay. A complete description of the demonstration and a summary of its results are available in the Innovative Technology Verification Report (EPA/600/R-01/010).

## DEMONSTRATION RESULTS:

Mean sample recoveries ranged from 71 to 84 percent for the shallow depth interval, and 75 to 101 percent for the moderate depth interval. Samples were collected at all depth intervals and demonstration areas, which contained various sediment types. Samples were collected with consistent physical characteristics from two homogenous layers of sediment. Samples were collected from a clean sediment layer below a contaminated sediment layer at least as well as comparable technologies. The sampler was able to be adequately decontaminated. Samples were collected in a short sampling time.

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# ART'S MANUFACTURING AND SUPPLY

(AMS™ Dual-Tube Liner Soil Sampler)

## TECHNOLOGY DESCRIPTION:

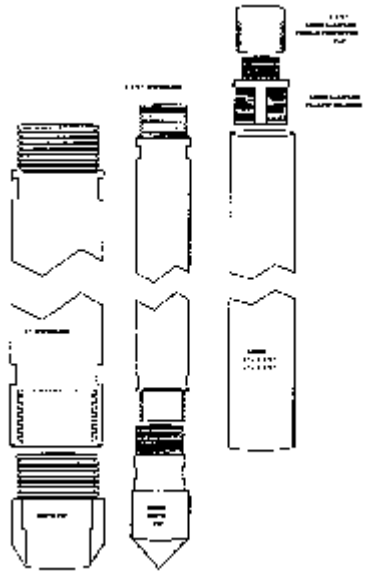
The Art's Manufacturing and Supply (AMS™) dual tube soil sampler, shown in the figure below, is designed to work with direct-push sampling rigs. The sampler consists of two steel tubes of differing diameters designed so that the two tubes fit within one another. The outer tube is equipped with a metal drive tip at the lower end and threaded at the upper end to allow additional metal extensions with increasing sampling depth and the addition of a drive head adaptor. The lower end of the inner tube is threaded with a plastic grabber to allow attachment of a polybutyrate liner during sampling or a solid-point metal inner drive tip during sampler advancement. The inner drive tip fits snugly within the outer drive tip, and both extensions and drive tips are held firmly in place by the drive head. Dual tube sampler extensions are available in 1-, 2-, 3-, and 4-foot lengths with wall thicknesses of 0.25 or 0.375 inch. The outer extension serves as a temporary casing so that continuous or discrete soil samples can be collected using the inner extension liner and drive tip assembly. The inner extension by itself can also be used for sampling.

The direct-push drill rig used to mount the dual tube liner sampler must be a 0.75-ton or heavier pickup truck supplied by the buyer or a custom-made truck assembled by AMS.

The dual tube liner sampler decreases the likelihood of cross-contamination, preserves sample integrity, collects samples chemically representative of the target sampling interval, can collect either discrete or continuous soil samples of unconsolidated materials, and does not generate drill cuttings.

## WASTE APPLICABILITY:

The AMS™ dual tube liner sampler can be used to collect unconsolidated, subsurface soil samples at depths that depend on the capability of the direct-push advancement platform. The sampler has been used to collect samples of sandy and clayey soil contaminated with high concentrations of volatile organic compounds (VOC). It can also be used to collect samples for semivolatile organic compound, metals, general minerals, and pesticides analyses.



Dual-Tube Liner Soil Sampler

## STATUS:

The AMS™ dual tube soil sampler was demonstrated under the Superfund Innovative Technology Evaluation (SITE) program in May and June 1997 at two sites: the Small Business Administration (SBA) site in Albert City, Iowa, and the Chemical Sales Company (CSC) site in Denver, Colorado. Samples collected during the demonstrations were analyzed for VOCs to evaluate the performance of the samplers.

Demonstration results indicate that the dual tube liner sampler had higher sample recoveries in the clayey soil present at the SBA site than the standard methods. Conversely, the sampler had lower recoveries than the standard methods in the sandy soil present at the CSC site. VOC concentrations in samples collected with the dual tube liner sampler did not significantly differ statistically from concentrations in samples collected using the standard methods. Sample integrity using the dual tube liner sampler was preserved in highly contaminated soil. The sampler's reliability and throughput were generally as good as those of the standard methods. Costs for the dual tube liner sampler were lower than costs related to the standard sampling methods. According to the developer, all sampler decontamination was done using the on-board wash station on the AMS direct push platform (the AMS Powerprobe 9600). This significantly reduced the overall time to sample and decontaminate its equipment.

Demonstration results are documented in the "Environmental Technology Verification" report for the sampler dated August 1998 (EPA/600/R-98/093).

Organics were the primary groundwater contaminant at the site, and trichloroethene (TCE) was selected as the contaminant of concern for the demonstration. The Demonstration Bulletin (EPA/540/MR-95/511) and Demonstration Capsule (EPA/540/R-95/511a) are available from EPA.

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# ART'S MANUFACTURING AND SUPPLY

(Sediment Core Sampler)

## TECHNOLOGY DESCRIPTION:

The Split Core Sampler is an end-filling sampler designed to collect undisturbed core samples of sediment up to a maximum depth of 4 feet below sediment surface (bss). The sampler collects samples from the sediment surface downward, not at discrete depth intervals. Sampler components include one or more split core tubes, couplings for attachment to additional split core tubes, a ball check valve-vented top cap, a coring tip, one or more extension rods, and a cross handle. All of these components are made of stainless steel, carbon-steel extension rods are also available from the developer. The sampler may be used with a core tube liner to facilitate removal of an intact sample from the split core tube. To collect a sediment sample, the sampler can either be manually pushed into the sediment using the cross handle or hammered into the sediment using a slide hammer or an electric hammer. The check valve in the sampler's top cap allows water to exit the sampler during deployment and creates a vacuum to help retain a sediment core during sampler retrieval. The sampler can be retrieved by hand, by reverse hammering using the slide hammer, or by using a tripod-mounted winch.

## WASTE APPLICABILITY:

The Split Core Sampler is designed to take virtually undisturbed samples of soils either at the surface or from the bottom of predrilled holes. These samples may be used for geotechnical testing, chemical or physical analysis.

## STATUS:

In April and May 1999, the EPA conducted a field demonstration of the Split Core Sampler along with one other sediment sampler. The performance and cost of the Split Core Sampler were compared to those of two conventional samplers (the Hand Corer and Vibrocorer), which were used as reference samplers. A complete description of the demonstration and a summary of its results are available in the "Innovative Technology Verification Report: Sediment Sampling Technology-Art's Manufacturing and Supply Inc., Split Core Sampler for Submerged Sediments" (EPA/600/R-01/009).

## DEMONSTRATION RESULTS:

The Sediment Core Sampler collects partially compressed samples of both consolidated and unconsolidated sediments from the sediment surface downward; sample representiveness may be questionable because of core shortening and core compression. Mean sample recoveries ranged from 89 to 100 percent in the shallow depth interval (0 to 4 inches bss), and 37 to 100 percent for the moderate depth interval (4 to 32 inches bss). No samples were able to be collected in the deep depth interval (4 to 11 ft bss). The Split Core Sampler's actual core lengths resembled the target core lengths in 96 percent of the sampling attempts in the shallow depth interval, and in 39 percent of the sampling attempts in the moderate depth interval. The sampler preserves sediment stratification in both consolidated and unconsolidated sediment samples.

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# BIONEBRASKA, INC.

(BiMelyze® Mercury Immunoassay)

## TECHNOLOGY DESCRIPTION:

The BioNebraska, Inc., BiMelyze® Mercury Immunoassay technology measures mercury concentrations in solid matrix samples. The field-portable immunoassay technology provides semiquantitative results based on the activity of mercury-specific monoclonal antibodies. The technology consists of two kits: an extraction kit and an assay tube kit. The kits together can process 16 samples.

The solid matrix samples are first extracted using a 2:1:1 mixture of hydrochloric acid, nitric acid, and deionized water. A buffer solution provided in the extraction kit is then added to the sample pH to 6 to 8, and the samples are filtered.

The extracted and filtered samples are then transferred to mercury assay tubes supplied in the assay tube kit. These tubes are coated with sulfhydryl-rich proteins that trap the mercury ions. After the addition of kit-supplied antibodies, conjugate, and substrate, the presence of mercury can be semiquantitatively determined by comparing the color of the sample tubes to the color of tubes of the mercury standards supplied in the kit. The standards are determined, within limits, by the customer. The limit of detection is 0.5 parts per million (ppm) and the analytical range is 0.5 to 40 ppm. The absorbance of the sample tubes can be measured using a spectrophotometer.

## WASTE APPLICABILITY:

The BiMelyze® Mercury Immunoassay technology has been used to analyze soil and sediment samples containing mercury. The technology works best on fine-grained material because of the larger surface- to-volume ratio. The effect of moisture content on the technology's applicability is unknown. The technology can provide semiquantitative or sample screening information and has been found to have a good potential as a Level I analytical method.

## STATUS:

The BiMelyze® Mercury Immunoassay technology was accepted into the Superfund Innovative Technology Evaluation (SITE) program in 1994 and was demonstrated in August 1995 at two sites: the Carson River Mercury (CRM) site in Reno, Nevada, and the Sulfur Bank Mercury Mine (SBMM) site in Clear Lake, California. Samples collected during the demonstrations were split for analysis in the field using the BiMelyze[7] Mercury Immunoassay technology and for later confirmatory analysis using standard inductively coupled plasma (ICP) mass spectrometry (MS). A total of 110 soil and sediment samples were collected from the CRM and SBMM sites (55 samples from each site) and split. The demonstration results indicate that the BiMelyze® Mercury Immunoassay technology agreed with ICP MS results for 66 percent of the samples analyzed. Demonstration results are documented in the "Innovative Technology Evaluation Report" from July 1998.

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# BRUKER ANALYTICAL SYSTEMS, INC.

(Mobile Environmental Monitor)

## TECHNOLOGY DESCRIPTION:

The Bruker Analytical Systems, Inc. (Bruker), mobile environmental monitor (see photograph below) is a field-transportable, gas chromatography/mass spectrometer (GC/MS) designed to identify and measure organic pollutants in various environmental media. The MS uses a quadruple mass analyzer similar to most conventional instruments. Like conventional MSs, this instrument can identify and quantify organic compounds on the basis of their retention time, molecular weight, and characteristic fragment pattern. The integrated GC allows introduction of complex extracts for separation into individual components and subsequent analysis in the MS.

The Bruker instrument's design and electronics are specially designed for field use. The instrument is designed to operate with battery power and can be used in various environmental situations with minimum support requirements.

The mobile environmental monitor was originally designed for the military to detect and monitor chemical warfare agents. Environmental samples may be introduced to the MS through the direct air sampler or the GC. Results are collected and stored in a computer, where data is reduced and analyzed. The computer provides reports within minutes of final data acquisition.

## WASTE APPLICABILITY:

The Bruker mobile environmental monitor is designed to detect the full range of volatile and semivolatile organic compounds directly in air and in water, soil, sediment, sludge, and hazardous waste extracts. It provides in-field, real-time support during the characterization and remediation phases of cleanup at a hazardous waste site.

Bruker Mobile Environmental Laboratory

## STATUS:

This technology was demonstrated at the Re-Solve, Inc., and Westborough Superfund sites in EPA Region 1. The technology was used to analyze polychlorinated biphenyls and polynuclear aromatics in soil and the full range of Superfund-targeted volatile organic compounds in water. Splits of all samples analyzed in the field were shipped to a laboratory for confirmatory analysis using standard EPA analytical methods.

The SITE demonstration was completed in September 1990, and the final report (EPA/600/X-91/079) is available from EPA. The results of this study were presented at the American Society for Mass Spectrometry Conference in May 1991 and at the Superfund Hazardous Waste Conference in July 1991. A recent survey of regional laboratories identified additional testing of this technology as a priority need.

Bruker has developed an additional system that addresses recommendations made in the project report. This system, designated the EM640, has increased mass range, decreased power consumption, faster sample analysis, and automated report generation. The EM640 was evaluated in July and September 1995 through the U.S. EPA Environmental Technology Verification Program (ETV). The evaluation showed that the EM640 provides "useful, cost-effective data for environmental problem-solving and decision-making." The Environmental Monitoring Systems Laboratory-Las Vegas purchased a Bruker mobile environmental monitor in fiscal year 1992 to pursue other applications and to expand the scope of this project.

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# CHEMetrics, Inc.

Total Petroleum Hydrocarbon Field Soil Test Kit
(RemediAid™)

## TECHNOLOGY DESCRIPTION:

The RemediAid™ Total Petroleum Hydrocarbon Test Kit is a rapid, simple field test for measuring petroleum hydrocarbon contamination in soil. The patented test is based upon the Friedel-Crafts Reaction. The kit responds to all hydrocarbon products as long as they contain aromatic hydrocarbons; thus, gasoline, diesel and other petroleum products heavier than diesel (such as lubricating oil), can be detected. RemediAid™ is unique because the colored reaction product is measured directly in the solvent by a portable absorbance photometer.

The test kit is administered as follows: A premeasured sample of soil is added to a reaction tube that contains anhydrous sodium sulfate, a drying agent. The soil is extracted with 20 mL of dichloromethane. Florisil™, is added to the soil extract to remove any natural organic material from the extract and minimize associated interference. A vacuum-sealed ampoule containing aluminum chloride is snapped in the soil extract. The hydrocarbons in the solvent react with the aluminum chloride to produce a soluble colored product directly proportional to the petroleum hydrocarbon concentration in the sample. The absorbance of the sample is measured in a portable, battery powered, LED-based colorimeter at 430 nm and converted to mg/kg (ppm) hydrocarbon in the soil by use of a formula. The soil extract can be diluted to bring absorbance readings in range in cases where the contamination levels are high.

Both the dichloromethane and the aluminum chloride are packaged in vacuum-sealed ampoules, which help minimize user contact with reagents. The starter kit includes the portable photometer, balance, and enough supplies to complete eight soil analyses. These come packaged in a portable carrying case. A replenishment kit includes enough supplies to perform 16 soil analyses. The device is designed to be used by those with basic wet chemistry skills.

## WASTE APPLICABILITY:

RemediAid™ Total Petroleum Hydrocarbon Kit can detect petroleum fuels containing aromatic hydrocarbons in soils.

## STATUS:

In June 2000, the RemediAid™ kit performance was evaluated for a wide range of performance attributes in a SITE field demonstration at Port Hueneme, California. Results were compared to an off-site laboratory that utilized reference methods from "Test Methods for Evaluating Solid Waste" (SW-846) Method 8015B (modified). Results from the demonstration have been published in an Innovative Technology Verification Report (ITVR) (EPA/600/R-01/082).

## DEMONSTRATION RESULTS:

The demonstration involved the analysis of 74 soil environmental samples, 89 soil performance evaluation (PE) samples and 36 liquid PE samples. Collectively, these samples represented a wide range of matrix types and contamination. The ITVR report concluded that RemediAid™ exhibited the following desirable characteristics of a field TPH measurement device: (1) good accuracy, (2) good precision, (3) lack of sensitivity to interferents that are not petroleum hydrocarbons (PCE and 1,2,4-trichlorobenzene), (4) high sample throughput, (5) low measurement costs, and (6) ease of use. Despite some of the limitations observed during the demonstration, the demonstration findings collectively indicated that the RemediAid™ kit is a reliable field measurement device for TPH in soil.

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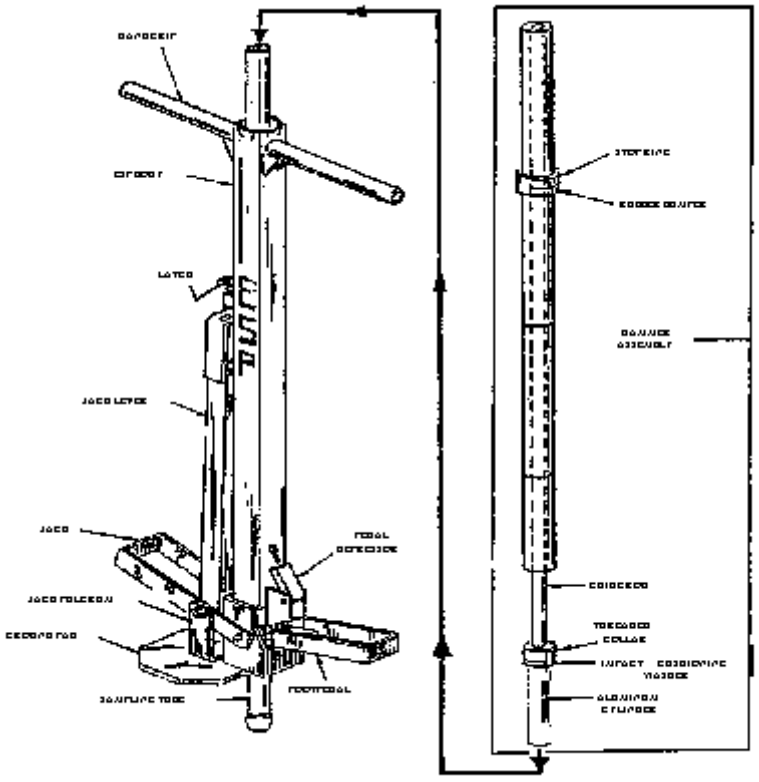
# CLEMENTS, INC.

(JMC Environmentalist's Subsoil Probe)

## TECHNOLOGY DESCRIPTION:

JMC Environmentalist's Subsoil Probe (ESP) developed by Clements Associates, Inc., consists of a sampling tube assembly, the ESP body, and a jack used to assist in sample retrieval (see figure below). The sampler can be advanced using manual or direct-push methods. The primary component of the ESP body is a heat-treated, 4130 alloy steel, nickel-plated sampling tube. The tube has a uniform 1.125-inch outer diameter and is 36 inches long. The ESP tube comes with three interchangeable stainless-steel tips (a solid drive point, a standard cutting tip, and a wet cutting tip) and inner sample liners that can also be used for sample storage.

The ESP body serves as a base and guide for the sampling tube as it is driven into or retrieved from a borehole. The jack used to retrieve the sample also allows operators to smoothly lower the sampler and tool string into the borehole at a controlled rate, thereby minimizing borehole disturbance.



Clements' ESP

According to the developer, the ESP sampler is simple to operate and requires no special training to use, is unaffected by variable field conditions, can collect either discrete or continuous soil samples of unconsolidated materials, can be used to characterize subsurface soil contamination, is easily transportable, and does not generate drill cuttings.

## WASTE APPLICABILITY:

The ESP sampler can be used to collect unconsolidated, subsurface soil samples at depths of 4 feet below ground surface (bgs); however, through the use of extensions, samples from depths of up to 25 feet bgs can be collected. Physical limitations of ESP sampler operation depend on the method of sampler advancement and the nature of the subsurface matrix. The technology is primarily restricted to unconsolidated soil free of large cobbles or boulders. The sampler can also be used in sediment containing gravel-sized material supported by a finer-grained matrix. Originally, the sampler was designed for sampling agricultural residues containing radioactive trace elements. The sampler has been used to collect samples of sandy and clayey soil contaminated with high concentrations of volatile organic compounds (VOC). The sampler can also collect samples for polychlorinated biphenyl, polynuclear aromatic hydrocarbon, pesticides, and metals analyses. The ESP sampler was accepted into the Superfund Innovative Technology Evaluation (SITE) program in May 1997 and was demonstrated in May and June 1997 at two sites: the Small Business Administration (SBA) site in Albert City, Iowa, and the Chemical Sales Company (CSC) site in Denver, Colorado. Samples collected during the demonstrations were analyzed for VOCs to evaluate the performance of the samplers.

## STATUS:

Demonstration results indicate that the ESP sampler had higher sample recoveries in both the clayey soil present at the SBA site and in the sandy soil present at the CSC site than the standard methods. VOC concentrations in samples collected with the ESP sampler from the SBA site significantly differed statistically from concentrations in samples collected using the standard methods; however, this difference was not observed for samples collected from the CSC site. Sample integrity using the ESP sampler was preserved in highly contaminated soil. The sampler's reliability and throughput were generally better than those of the standard methods. Costs for the ESP sampler were much lower than costs related to the standard sampling methods.

Demonstration results are documented in the "Environmental Technology Verification" report for the sampler dated August 1998 (EPA/600/R-98/097).

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# DEXSIL CORPORATION

(Environmental Test Kits)

## TECHNOLOGY DESCRIPTION:

The Dexsil Corporation (Dexsil) produces two test kits that detect polychlorinated biphenyls (PCB) in soil: the Dexsil Clor-N-Soil PCB Screening Kit, and the Dexsil L2000 PCB/Chloride Analyzer. The Dexsil Clor-N-Soil PCB Screening Kit, (see photograph below) extracts PCBs from soil and dissociates the PCBs with a sodium reagent, freeing chloride ions. These ions then react with mercuric ions to form mercuric chloride. The extract is then treated with diphenylcarbazone, which reacts with free mercuric ions to form a purple color. The less purple the color, the greater the concentration of PCBs in the sample.

The Dexsil L2000 PCB/Chloride Analyzer (see photograph on next page) also extracts PCBs from soil and dissociates the PCBs with a sodium reagent, freeing chloride ions. The extract is then analyzed with a calibrated, chloride-specific electrode. The L2000 instrument then translates the output from the electrode into parts per million (ppm) PCB.

These kits produce analytical results at different data quality levels. The Dexsil Clor-N-Soil PCB Screening Kit identifies samples above or below a single concentration, which is generally tied to regulatory action levels. The Dexsil L2000 PCB/Chloride Analyzer quantifies specific concentrations of PCBs, from 2 to 2,000 ppm, in a sample. The applicability of these methods depends on the data quality needs of a specific project. Both technologies can be used on site for site characterization or a removal action.


Dexsil Clor-N-Soil PCB Screening Kit

## WASTE APPLICABILITY:

The Dexsil Clor-N-Soil PCB Screening Kit and the Dexsil L2000 PCB/Chloride Analyzer can detect PCBs in soil, sediment, transformer oils, and water.

These test kits were demonstrated at a PCB-contaminated facility in EPA Region 7. About 200 soil samples were collected and analyzed on site using the Dexsil test kits. Soil samples were not dried prior to analysis. Split samples were submitted to an off-site laboratory for confirmatory analysis by SW-846 Method 8080. Demonstration data were used to evaluate the accuracy and precision of the test kits relative to internal quality control samples and to formal laboratory data. These data were also used to determine operating costs.

The sampling and field analyses for this technology demonstration were completed in August 1992. The Innovative Technology Evaluation Report (EPA/540/R-95/518) is available from EPA. The Office of Solid Waste has designated the L2000 Method for PCB screening of soil as Method 9078, to be included in the third update to the third edition of SW-846.

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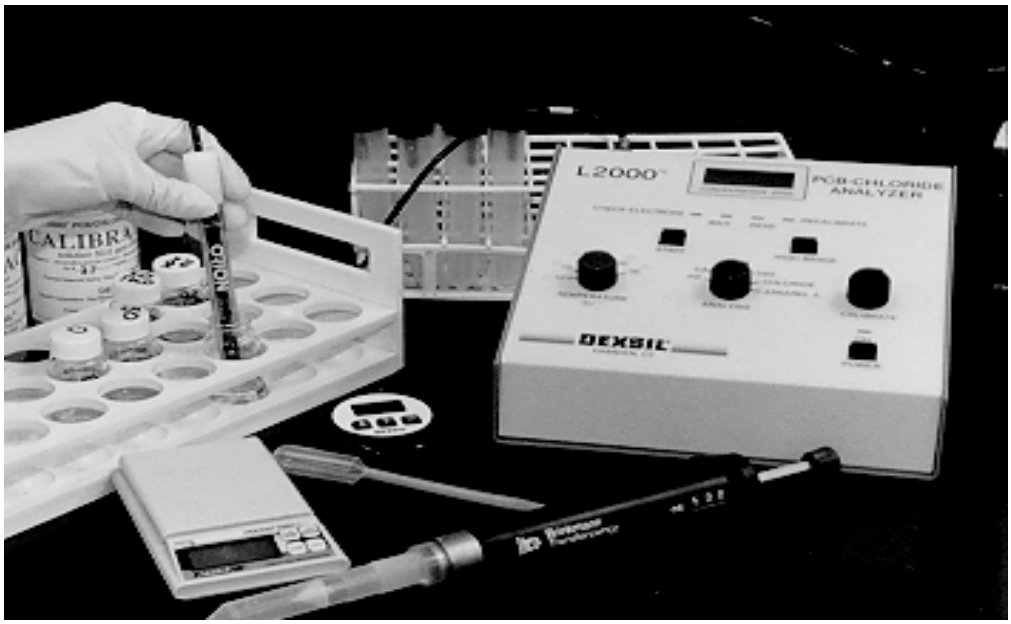

Dexsil L2000 PCB/Chloride Analyzer

# DEXSIL CORPORATION

(Emulsion Turbidimetry)

## TECHNOLOGY DESCRIPTION:

The PetroFLAG™ System manufactured by Dexsil is based on emulsion turbidimetry, which involves measurement of the light scattered by an emulsion. With the PetroFLAG™ System, a proprietary, nonpolar, organic solvent mixture composed of alcohols, primarily methanol, is used to extract petroleum hydrocarbons from soil samples. A proprietary developer solution that is polar in nature that acts as an emulsifier is added to a sample extract in order to precipitate the aromatic and aliphatic hydrocarbons and form uniformly sized micelles. Light at a wavelength of 585 nanometers is passed through the emulsion, and the amount of light scattered by the emulsion at a 90-degree angle is measured using a turbidimeter. The total petroleum hydrocarbon (TPH) concentration in the emulsion is then determined by comparing the turbidity reading for the emulsion to a reference standard or to a standard calibration curve. The TPH concentration thus measured is a function of the mean molecular weight of the hydrocarbons present in the sample.

## WASTE APPLICABILITY:

The PetroFLAG System is a field portable method capable of determining total petroleum hydrocarbons in soil.

## STATUS:

In June 2000, the EPA conducted a field demonstration of the PetroFLAG™ System and six other field measurement devices for TPH in soil. The performance and cost of the PetroFLAG™ System were compared to those of an off-site laboratory reference method. A complete description of the demonstration and summary of its results are available in the "Innovative Technology Verification Report: Field Measurement Devices for Total Petroleum Hydrocarbons in Soil-Dexsil® Corporation PetroFLAG™ System " (EPA/600/R-01/092).

## DEMONSTRATION RESULTS:

The method detection limits for the PetroFLAG™ System were determined to be 20 millograms per kilogram. Seventy-three percent of results agreed with those of the reference method. Of 91 results used to measure measurement bias, 9 were biased low, and 82 were biased high. For soil environmental samples, the results were statistically the same as the reference method for one out of four sampling areas. The PetroFLAG™ System exhibited similar overall precision to the reference method (RSD ranges were 6 to 19 percent and 5.5 to 16 percent for the PetroFLAG™ System and the reference method respectively). The PetroFLAG™ System showed a mean response of less than 5 percent for interferents such as MTBE, PCE, and soil spiked with humic acid. There were varying responses for other interferents, such as Stoddard solvent (42.5 percent), turpentine (103 percent), and 1, 2, 4-trichlorobenzene (16 percent). The PetroFLAG™ System showed a statistically significant decrease (17 percent) in TPH results when the soil moisture content was increased from 9 to 16 percent in weathered gasoline samples. This effect was not observed in diesel soil samples.

Both the measurement time and cost compared well with those of the reference method.

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# EDAX PORTABLE PRODUCTS DIVISION

(formerly C-Thru Technologies Corporation)
(Metal Analysis Probe [MAP®] Spectrum Assayer)

## TECHNOLOGY DESCRIPTION:

The C-Thru Technologies Corporation (C-Thru) Metal Analysis Probe Spectrum Assayer (see photograph below) is a field portable X-ray fluorescence (FPXRF) analyzer. This FPXRF analyzer can simultaneously analyze for select metals. It is compact, lightweight, and does not require liquid nitrogen. A rechargeable battery allows the FPXRF analyzer to be used at remote sites where electricity is unavailable.

The instrument is composed of a control console connected to an ambient scanner with a cable. The basic MAP® system also includes a carry pack, rechargeable batteries, operator's manual, target metal standard, and a shipping case. The control console contains a 256-multichannel analyzer with a storage capacity of 325 spectra and analyses. The control console with batteries weighs 11 pounds and the ambient scanner weighs about 2.5 pounds.

The MAP® Spectrum Assayer uses a silicon X-ray detector to provide elemental resolution. The unit demonstrated under the SITE Program used a Cadmium-109 radioisotope as the excitation source. Cobalt-57 and Americium-241 sources are also available.

The MAP® Spectrum Assayer is capable of analyzing 9 to 12 samples per hour based on a 240-second analysis time. The instrument is empirically calibrated by the developer. C-Thru requires a 1-day operator training and radiation safety course prior to obtaining a specific license to operate the instrument. The standard MAP® 3 Portable Assayer package used in the demonstration sold for $32,000.

The MAP® Spectrum Assayer provides high sample throughput and is reportedly easy to operate. Analytical results obtained by this instrument may be comparable to the results obtained by EPA-approved methods.


MAP® Assayer

## WASTE APPLICABILITY:

The MAP® Spectrum Assayer can detect select metals in soil and sediment samples and in filter and wipe samples. It can also detect lead in paint. The MAP® Portable Assayer reportedly can quantitate metals at concentrations ranging from parts per million to percentage levels.

## STATUS:

The MAP® Spectrum Assayer has been used at a number of Superfund sites across the country. It was evaluated in April 1995 as part of a SITE demonstration of FPXRF instruments. The results are summarized in Technical Report No. EPA/600/R-97/147, dated March 1998. The instrument was used to identify and quantify concentrations of metals in soils. Evaluation of the results yielded field-based method detection limits, accuracy, and precision data from the analysis of standard reference materials and performance evaluation samples.

Comparability of the FPXRF results to an EPA-approved reference analytical method was also assessed during the demonstration. The Draft Fourth Update to SW-846 includes Method 6200, dated January 1998, which is based on this work.

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# ENVIRONMENTAL SYSTEMS CORPORATION

(Ultraviolet Fluorescence Spectroscopy)

## TECHNOLOGY DESCRIPTION:

The Synchronous Scanning Luminoscope (SSL) uses a xenon lamp to produce a multiwavelength ultraviolet light beam that passes through an exitation monochromator before irradiating a sample extract held in a quartz cuvette. When the sample extract is irradiated, aromatic hydrocarbons in the extract emit light at a longer wavelength than does the light source. The light emitted from the sample extract passes through another monochromator, the emission monochromator, and is detected using a photomultiplier tube. The photomultiplier tube detects and amplifies the emitted light energy and converts it into an electrical signal. This signal is used to determine the intensity of the light emitted and generate a spectrum for the sample.

The components of the SSL are structured to maintain a constant wavelength interval between the excitation and emission monochromators. This modification of classical fluorescence technology is called synchronous fluorescence and takes advantage of the overlap between the excitation and emission spectra for a sample to produce more sharply defined spectral peaks.

## WASTE APPLICABILITY:

The SSL gives a quantitative measurement of total petroleum hydrocarbons (TPH) concentrations in soil samples using ultraviolet fluorescence spectroscopy.

## STATUS:

In June 2000, the EPA conducted a field demonstration of the SSL and six other field measurement devices for TPH in soil. The performance and cost of the SSL were compared to those of an off-site laboratory reference method. A complete description of the demonstration and summary of its results are available in the "Innovative Technology Verification Report: Field Measurement Devices for Total Petroleum Hydrocarbons in Soil-Environmental Systems Corporation Synchronous Scanning Luminoscope" (EPA/600/R-01/083).

## DEMONSTRATION RESULTS:

The method detection limit for the SSL was determined to be 36 mg/kg. Seventy-five of 108 results used to draw conclusions regarding whether the TPH concentration in a given sampling area or sample type exceeded a specific action level agreed with those of reference method. There were 10 false positives, and 23 false negatives. Of 102 results used to measure measurement bias, 64 were biased low, 37 were biased high, and 1 showed no bias. For soil environmental samples, the results were statistically the same as the reference method for all five sampling areas. The SSL exhibited greater overall precision than the reference method (RSD ranges were 8 to 12 percent and 5.5 to 18 percent for the SSL and the reference method, respectively). The SSL showed a mean response of less than 5 percent for interferents such as MTBE, PCE, Stoddard solvent, turpentine, 1, 2, 4-trichlorobenzene, and soil spiked with humic acid. The SSL TPH results were unaffected when the moisture content was increased. Both the measurement time and cost compared well with those of the reference method.

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# ENVIRONMENTAL TECHNOLOGIES GROUP, INC.

(AirSentry Fourier Transform Infrared Spectrometer)

## TECHNOLOGY DESCRIPTION:

This air monitoring system (see photograph below) is a field-deployable, open-path Fourier transform infrared (FTIR) spectrometer that measures infrared absorption by infrared-active molecules. The spectrometer system transmits an infrared beam along an open air path to a retroflector target that returns it to the spectrometer. The total air path can be up to 1 kilometer long. Analysis is performed using a quantitative reference spectrum of known concentration, together with classical least squares data fitting software routines. The system does not require acquisition of an air sample; this factor assures that sample integrity is not compromised by interaction between the sample and the collection and storage system.

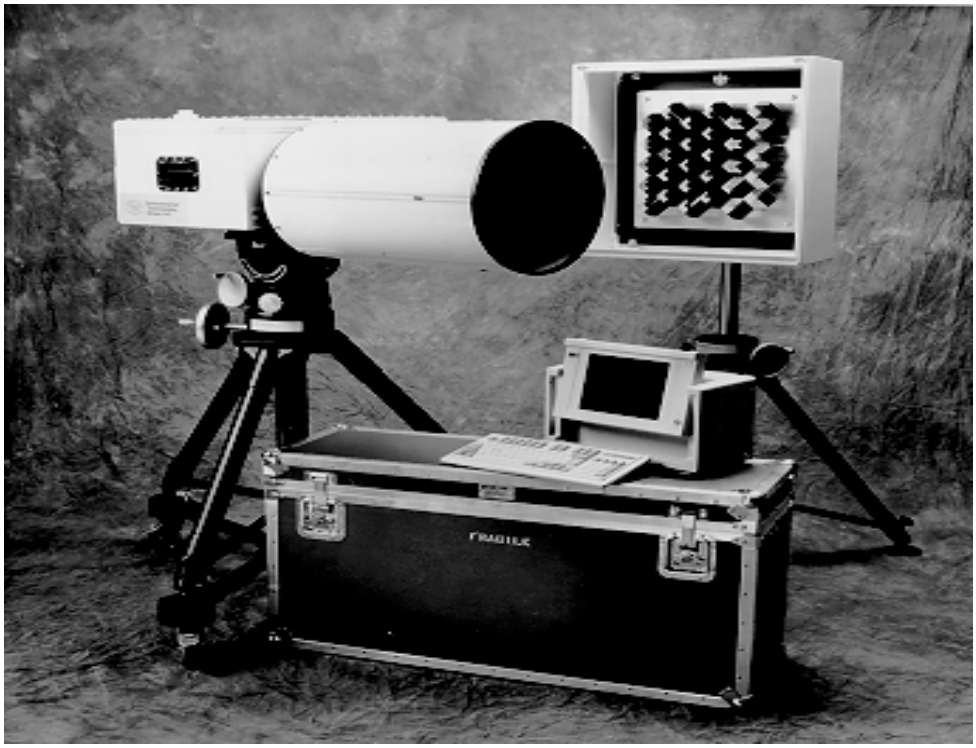
A measurement over several hundred meters requires only a few minutes, which allows determination of temporal profiles for pollutant gas concentrations. The spectrometer requires performance verification procedures, but does not require calibration.

## WASTE APPLICABILITY:

The AirSentry FTIR spectrometer can collect information on spectral absorption from a number of airborne vapors at one time, including both organic and inorganic compounds. This information is processed to obtain the average concentration over the entire pathlength. The system has been used to monitor fugitive emissions from industrial plants and from hazardous waste sites. By combining these measurements with measurements of wind speed, emission rates can be estimated. It can be used to monitor emissions from hazardous waste sites during remediation and removal.

## STATUS:

The AirSentry FTIR spectrometer was demonstrated during a 1990 SITE study at Shaver's Farm, a Superfund site in northwest Georgia. The purpose of this demonstration was to test performance during remedial activities and to develop and test on-site quality assurance procedures. Results of this study



AirSentry Fourier Transform Infrared Spectrometer

were published in a paper titled "Use of a Fourier Transform Spectrometer As a Remote Sensor at Superfund Sites: Proceedings of the International Society for Optical Engineering" --SPIE Vol. 1433, p. 302, Measurement of Atmospheric Gases, Los Angeles, CA, 21-23 January 1991, presented at a 1991 conference.

The AirSentry FTIR spectrometer has been evaluated in several other field studies and has been proven capable of detecting various airborne atmospheric vapors. The AirSentry FTIR gas analysis software, which automatically identifies and quantifies compounds in the presence of background interferences, was evaluated in a 1991 field study sponsored by EPA Region 7. Results of this field evaluation are published in an EPA report entitled "A Field-Based Intercomparison of the Qualitative and Quantitative Performance of Multiple Open-Path FTIR Systems for Measurement of Selected Toxic Air Pollutants."

Another field evaluation of the AirSentry FTIR spectrometer was conducted at a Superfund site in January 1992. During the field evaluation, the FTIR spectrometer was compared with gas chromatography/mass spectrometry techniques using air samples collected in canisters. Results from this field evaluation are published in an EPA report titled "Superfund Innovative Technology Evaluation, The Delaware SITE Study, 1992" (EPA/600/A3-91/071).

A guidance document detailing the steps required for successful field operation of the FTIR-based open path monitoring systems is available from EPA and is referred to as Method TO-16 in the "EPA Compendium of Methods for Determination of Toxic Organic Compounds in the Ambient Air". For a copy of the draft document, contact the EPA Project Manager listed below.

This technology remains available from the Environmental Technologies Group, Inc. as well as other commercial companies. For further information about the technology, contact the EPA Project Manager.

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# FUGRO GEOSCIENCES, INC.

(formerly LORAL CORPORATION)
(Rapid Optical Screening Tool)

## TECHNOLOGY DESCRIPTION:

The Fugro Rapid Optical Screening Tool (ROST ™), shown in the figure below, is an in situ screening sensor used in conjunction with Cone Penetration Testing (CPT) systems that provides rapid delineation of petroleum hydrocarbons (PHC). ROST ™ characterizes the PHCs from the fluorescence response induced in the polycyclic aromatic hydrocarbon (PAH) compounds contained within the contaminant material. ROST ™ continuously detects separate phase PHCs in the bulk soil matrix in the vadose, capillary fringe, and saturated zones and provides a screening of the relative concentration present. ROST ™ also presents the spectral signature of the detected PHC, which often allows identification of the contaminant type (such as gas, diesel, coal tar,creosote, etc.). CPT testing is conducted simultaneously with ROST ™ testing and provides real-time, in situ lithologic data. Fugro can also deploy ROST ™ from percussion-type Direct Push Technology equipment.

The measurements are performed in situ and physical sampling during the delineation phase is not required. However, since ROST™ is a screening tool, a limited amount of confirmation soil sampling is recommended. The list of petroleum products for which this method is appropriate includes, but is not limited to: gasoline, diesel fuel, crude oil, jet fuel, heating oil, coal tar, kerosene, lubricating oils, and creosote.

The ROST ™ methodology utilizes laser-induced fluorescence spectroscopy for PHC screening. Pulsed laser light is used to excite PAHs and is delivered via a fiber optic cable to a sub-unit mounted directly behind the CPT penetrometer probe (cone). The light is directed through a sapphire window on the side of the sub-unit and onto the surface of the soil. PAHs present within the soil absorb the excitation light and emit the absorbed energy as fluorescence. A portion of this fluorescence is returned by a collection fiber to the surface and is analyzed by the ROST ™ unit. ROST ™ measures and reports the following three fluorescence parameters in real time:

Rapid Optical Screening Tool

- Intensity of the fluorescence emitted by the PHC.
- Spectrum of wavelengths of light emitted by the PHC.
- Lifetime of duration of the fluorescence emitted by the PHC.

The fluorescence intensity is generally proportional to concentration and identifies the relative PHC concentration present. The fluorescence intensity is plotted continuously with depth on a computer monitor in the CPT rig as testing proceeds and allows immediate identification of affected soils. The spectral and temporal data are also presented on the computer monitor in real-time and comprise the spectral signature of the contaminant which often allows identification of product type. A log of the fluorescence intensity with depth and contaminant signatures is plotted on a printer in the CPT rig immediately following each test.

## WASTE APPLICABILITY:

The Fugro ROST ™ system is designed to qualitatively detect contaminant materials containing PAH constituents, including, but not limited to gasoline, diesel fuel, crude oil, jet fuel, heating oil, coal tar, kerosene, lubricating oils, and creosote.

## STATUS:

ROST ™ has been commercially available since September 1994 and was evaluated under the U.S. EPA's Environmental Technology Verification (ETV) program. The final report (EPA/600/R-97/020), dated February 1997 is available from EPA or may be downloaded from the EPA's web site (*http://clu-in.com/csct/verstate.htm*).

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# GEOPROBE SYSTEMS

(Large Bore Soil Sampler)

## TECHNOLOGY DESCRIPTION:

The Large Bore Soil Sampler is a single tube-type, solid barrel, closed-piston sampler (see figure below). It is designed to be driven by the Geoprobe percussion probing machine to collect discrete interval soil samples but can be used for continuous coring if needed. This direct push type sampler is for use in unconsolidated soils. It is capable of recovering a soil core 22 inches long by 1-1/16 inches in diameter (320 millilter (mL) volume). A liner is inserted inside the sampler body to retain the sample after collection and to facilitate removal from the sampler body. Liner materials are available in brass, stainless steel, teflon, and clear plastic (cellulose acetate butyrate).

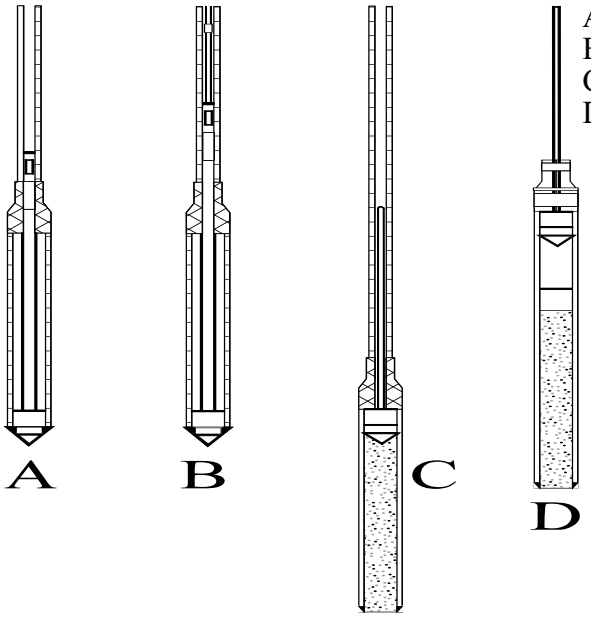
## WASTE APPLICABILITY:

The Large Bore Soil Sampler can be used to collect soil samples for both organic and inorganic analytes when appropriate liner materials are used. The sampler has been used to collect samples to be analyzed for herbicides, pesticides, polychlorinated biphenyls (PCBs), semivolatile organic compounds, aromatic and halogenated volatile organic compounds (VOCs), petroleum fuels, metals, nitrates, dioxins and furans.

## STATUS:

Geoprobe's Large Bore Soil Sampler was demonstrated under the SITE program during the early summer of 1997. The demonstration results indicate that the Large-Bore Soil Sampler can provide useful, cost-effective samples for environmental problem solving. However, in some cases, VOC data collected using the Large Bore Soil Sampler may be statistically different from VOC data collected using the reference sampling method. Also, the integrity of a lined sample chamber may not be preserved when the sampler is advanced through highly contaminated zones in clay soils. Demonstration results are documented in the "Environmental Technology Verification" report for the sampler dated August 1998 (EPA/600/R-98/092).

There are several hundred Geoprobe owner/operators who use the Large Bore Soil Sampler for geo-environmental investigations. This soil sampler has been used in all 50 states and several foreign countries to complete thousands of projects. It is used primarily for geo-environmental investigations to define soil types and delineate contaminant distribution. The Large Bore Soil Sampler is available in stock from Geoprobe Systems. Geoprobe has developed other soil and groundwater sampling tools that are also widely used in the geo-environmental field.




A. Driving the sealed sampler
B. Removing the stop-pin
C. Collecting a sample
D. Recovering sample in liner

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# GEOPROBE SYSTEMS

(Geoprobe Soil Conductivity Sensor)

## TECHNOLOGY DESCRIPTION:

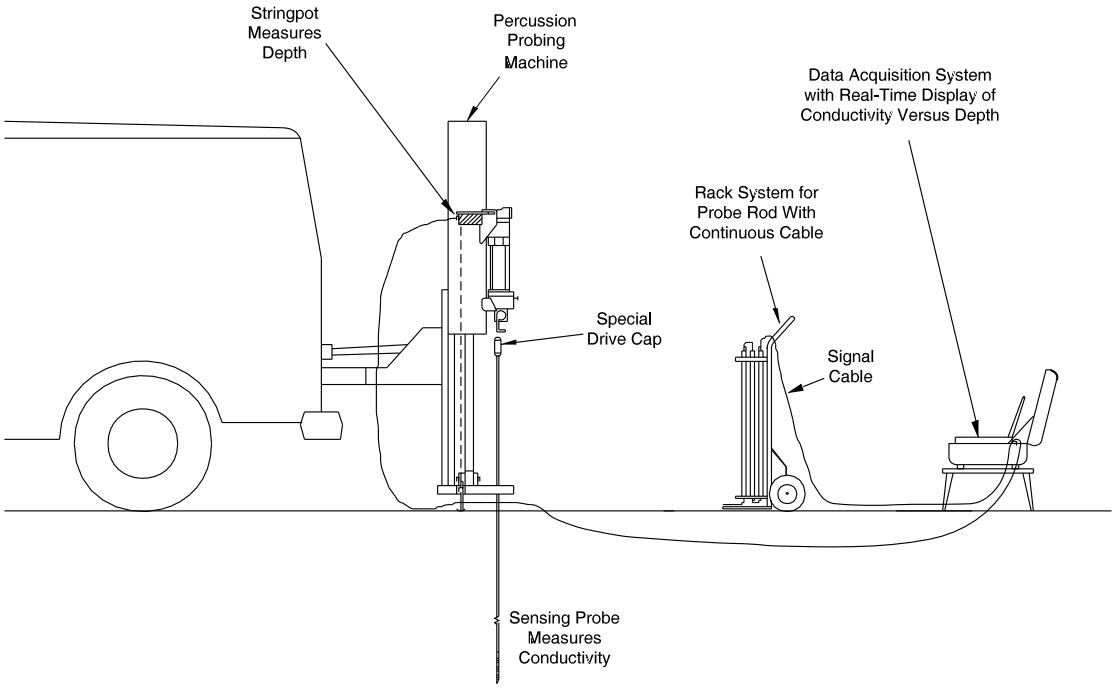
The Geoprobe soil conductivity sensor, shown in the figure below, identifies lithology and potential contamination by measuring the electrical conductivity of soil and hydrogeologic fluids. Soils vary in their electrical conductivity depending on particle size; for example, clays and silts generally have high conductivities, while sand and gravels exhibit low conductivities. Overall, soil and rock are resistant to current. Pore fluids and the amount of dissolved solids in these fluids also influence soil conductivity.

The Geoprobe conductivity sensor uses an isolated array of sensing rings to measure this conductivity. The sensor is principally designed to help determine subsurface stratigraphy. The sensor may also help characterize subsurface contamination, especially where high conductivity leachates or brines are involved.

The principal components of the complete Geoprobe system are as follows:

- A Geoprobe hydraulic soil probing machine
- Standard sampling rods supplied with the system
- A cable, threaded through the sampling rod that introduces the current
- The conductivity sensor
- A data receiver connected to a personal computer to record the sensor's measurements

The hydraulic probing machine uses a combination of pushing and hammering to advance 3-foot-long segments of 2.54-centimeter-diameter hollow steel sampling rods. The conductivity sensor is attached to the lead section of the sampling rod.




Schematic Diagram of the Geoprobe Soil Conductivity Sensor

The conductivity sensor consists of four stainless-steel contact rings fitted around a central steel shaft. Plastic electronically isolates the contact rings from the steel shaft. A hollow steel rod extends above the uppermost stainless steel ring, housing a shielded signal cable that connects the contact rings with an external power source, measurement system, and data logging system. The soil conductivity sensor can be used in a dipole array or a Schlumberger array. The dipole array is used when greater resolution is required. The Schlumberger array is generally used when optimal soil-to-probe contact cannot be maintained.

## WASTE APPLICABILITY:

The Geoprobe conductivity sensor is designed to determine subsurface stratigraphy. Only highly conductive contaminants such as oil field brine can be directly measured by the sensor.

## STATUS:

The Geoprobe conductivity sensor field demonstration was conducted in September 1994. The report is available.

Improvements to the unit include the availability of stronger 1.25-inch diameter probe rods, more durable probes, dipole-type probes used for dipole measurements, and expendable probes for use when grouting is required.

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# GRASEBY IONICS, LTD., and PCP, INC.

(Ion Mobility Spectrometry)

## TECHNOLOGY DESCRIPTION:

Ion mobility spectrometry (IMS) is a technique used to detect and characterize organic vapors in air. IMS involves the ionization of molecules and their subsequent temporal drift through an electric field. Analysis and characterization are based on analyte separations resulting from ionic mobilities rather than ionic masses; this difference distinguishes IMS from mass spectrometry. IMS operates at atmospheric pressure, a characteristic that has practical advantages over mass spectrometry, allowing a smaller analytical unit, lower power requirements, lighter weight, and easier use. These factors may facilitate use of IMS for mobile, field applications.

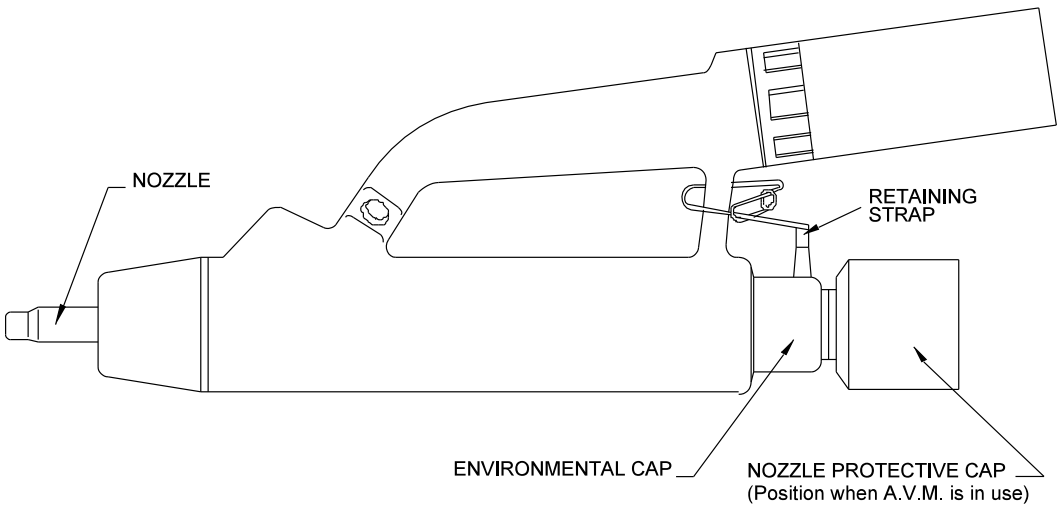
## WASTE APPLICABILITY:

The IMS units, which are intended to be used in a preprogrammed fashion, can monitor chloroform, ethylbenzene, and other volatile organic compounds in a defined situation. IMS units can analyze air, vapor, soil, and water samples. However, for analysis of liquid and solid materials, the contaminants must be introduced to the instrument in the gas phase, requiring some sample preparation.

## STATUS:

Graseby Ionics, Ltd. (Graseby), and PCP, Inc. (PCP), participated in a laboratory demonstration in 1990. Graseby used a commercially available,self-contained instrument that weighs about 2 kilograms (kg) (see figure below). PCP used a larger (12 kg) transportable IMS. This laboratory demonstration was the first opportunity to test the instruments on environmental samples. The demonstration results highlighted that the following needs must be satisfied before IMS is ready for field applications:

- Additional development of sampling or sample preparation strategies for soil and water analysis.
- Improvements in the design and performance of IMS inlets, in conjunction with the development of sampling and presentation procedures.




Airborne Vapor Monitor for IMS

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# HANBY ENVIRONMENTAL LABORATORY PROCEDURES, INC.

(Test Kits for Organic Contaminants in Soil and Water)

## TECHNOLOGY DESCRIPTION:

Hanby Environmental Laboratory Procedures, Inc. (H.E.L.P), field test kits for soil and water (as shown in the figure below) provide rapid, sensitive analyses for a broad range of organic contaminants. The kits have been used at spill and leak sites for petroleum substances including fuels, solvents, oils, pesticides, herbicides, and indirectly wood preservatives such as pentachlorophenols (PCP). The test kit methods are based on simple extraction and colorimetric procedures using Friedel-Crafts (F-C) chemical reactions. During analyses for PCPs suspended in diesel fuel carrier solvent, where the actual analyte does not undergo F-C reactions, it is necessary to perform other analyses to determine the ratio of the target compound to the detected carrier solvent. At locations where the type of contaminant is known, such as gasoline or diesel fuel sites, the appropriate calibration photograph for the substance is used which provides precise quantitative analytical information. Alternatively, H.E.L.P. provides a portable spectrophotometer which reads the sample results, identifying a wider variety of chemicals.

The test kits provide the equipment and reagents to perform 15 soil or water samples. Soil tests are performed using the following steps:

- Using the electronic balance, weigh 5 grams of soil into a beaker.
- Empty one solvent ampule into the beaker.
- Stir the sample for 2 minutes (extraction).
- Pour extract from the beaker into one of the sample test tubes.
- Empty one catalyst powder vial into the test tube, cap and shake for 3 minutes.
- Compare the developed color of the sample to the appropriate calibration photograph, or insert the test tube into the spectrophotometer for readout.

Water testing is performed in a similar manner, except that the extraction procedure is performed on a 500-milliliter water sample in a separatory funnel which comes with the water test kit.

Hanby Test Kit

## WASTE APPLICABILITY:

H.E.L.P. field test kits analyze aromatic, halogenated, and other compounds which participate in F-C reactions. These compounds include the complete range of fuel types such as gasoline, diesel fuel, and jet fuel, as well as all types of crude oils. The test kits are also used for the measurement of many other types of substances such as new and used motor oils, transformer oils, hydraulic fluids, and other types of organic liquids which contain only small amounts of F-C reacting compounds. The intense color of these reactions allows sensitivities of detection from 1 to 25 parts per million (ppm).
The availability of two solvent types for the kits provides a range from 1 ppm (with the lower range solvent) to 100,00 ppm (with the high range solvent).The H.E.L.P. test kit was used to indirectly screen and quantify PCP contamination in soils for a SITE demonstration in Morrisville, North Carolina in August 1993, using samples collected from a wood preserving site in Winona, Missouri. These samples contained PCP in a diesel carrier solvent. When the ratio of carrier solvent to PCP was constant, the PCP concentration data obtained using the H.E.L.P. test kit correlated well with sample splits analyzed at an off-site laboratory. Results from the demonstration have been published in an Innovative Technology Evaluation Report (EPA/540/R-95/514), which is available from EPA.

The field test kits and the associated spectrophotometer, the H.E.L.P. MATE 2000, were selected by the U.S. Department of Commerce and EPA Rapid Commercialization Initiative (RCI) as representative of "best available demonstrated technology" in March 1996. The technologies selected for RCI was demonstrated and assessed by EPA, the U.S. Departments of Energy, Commerce, and Defense, the California EPA, the Western Governor's Association, and the Southern States Energy Board throughout 1996 and 1997.

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# HEWLETT-PACKARD COMPANY

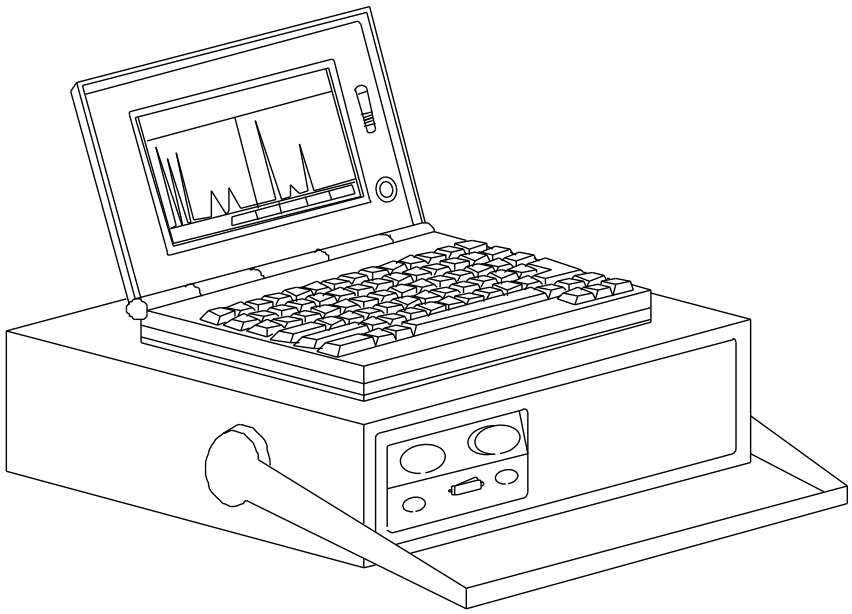
(via acquisition of MTI Analytical Instruments, Inc.)
(Portable Gas Analyzer/HP Micro GC)

## TECHNOLOGY DESCRIPTION:

The Hewlett-Packard (HP) portable gas analyzer, shown below, is a multi-channel, high- speed, portable micro gas chromatograph (GC) that provides isothermal analysis of gas-phase samples. The injector and thermal conductivity detector (TCD) are micro-electromechanical systems (MEMS). That is, they are fabricated from silicon using micro-machining techniques similar to that used to produce microprocessors, microcircuits, etc. As a result these chromatographic components are extremely small and exhibit extremely high reliability and performance. Depending on the analysis requirements, these two components are combined with one of a series of high performance/microbore capillary columns (ranging from 0.25 to 14 meters in length and 0.150-0.32 mm inside diameter [ID]) into an individually programmable analysis channel. Up to four independent, optimized analyses (separations) of a single gas sample can be performed simultaneously in a single instrument.

A gas sample is drawn into a sample loop with an internal vacuum pump. An aliquot of the sample is then introduced into the capillary column using the microvalves contained within the micro-machine injector. The maximum analysis time for components up to C10 is 160 seconds or less, making the HP Micro kGC one of the fastest commercially available gas chromatographs.

The HP portable gas analyzer houses an internal sealed lead acid battery and small refillable carrier gas cylinder providing up to 8 hours of continuous operation. When combined with a laptop computer and instrument control/data analysis software, the HP portable gas analyzer is fully capable of field operation.



P200 Gas Analyzer

## WASTE APPLICABILITY:

The HP portable gas analyzer can detect many volatile organic compounds (VOC) at concentrations as low as 1 ppm. A heated sample inlet system enables the gas analyzer to detect higher boiling compounds like naphthalene and hexachlorobutadiene. When combined with an air sampler/pre-concentrator (ex. Entech, Tekmar/Dohrmann) detection limits in the range of 1 to 10 parts per billion for EPA Method TO-14 compounds can be obtained.

The HP portable gas analyzer can be employed for the analysis of soil gases, VOC contaminants in groundwater, and, with the use of an air sampler/pre-concentrator device, VOCs in ambient air. The micro TCD is suitable for analyzing many types of organic and inorganic vapor-phase compounds. The HP portable gas analyzer can be used as part of a system to monitor VOC emissions from hazardous waste sites as part of first site assessment activities and as part of a remediation program. Because of its portability, high analytical speed, and relatively low detection limit, the gas analyzer provides results of comparable quality to laboratory based analysis instruments, including gas chromatography/mass spectrometry (GC/MS).

## STATUS:

The P200 gas analyzer was evaluated during a field study in August 1995. During the study, downwind vapors from an artificial source generator were analyzed. Preliminary results of the demonstration were presented in an article titled "Performance Comparison of Field-Deployable Gas Chromatographs with Canister TO-14 Analyses" in the *Proceeding of the 1996 U.S. EPA/Air and Waste Management Association International Symposium*, VIP-64, 1996.

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# HNU SYSTEMS, INC.

(HNU GC 311D Portable Gas Chromatograph)

## TECHNOLOGY DESCRIPTION:

The field-deployable HNU GC 311D portable gas chromatograph monitors a wide range of compound emissions from hazardous waste sites and other emissions sources before and during remediation (see photograph below). It has an internal carrier gas supply, operates on 110-volt line power, is microprocessor-controlled, and is temperature programmable. An internal printer plots chromatograms and prints data. Data can also be reported to an external computer, which is connected through an RS-232 outlet.

The instrument has simultaneous dual-detector capability and allows the user to choose from four interchangeable detectors: photoionization, flame ionization, electron-capture, and far ultraviolet absorbance. Capillary columns of all sizes can be installed. The instrument is capable of autosampling.The HNU GC 311D is applicable to a wide variety of vapor-phase pollutants. The photoionization detector is sensitive to compounds that ionize below 11.7 electron volts, such as aromatic compounds and unsaturated halocarbons. The flame ionization detector is sensitive to hydrocarbons. The electron-capture detector is sensitive to halocarbons and polychlorinated biphenyls. The far ultraviolet absorbance is a universal detector with characteristics similar to that of a thermal conductivity detector (TCD).

## STATUS:

The instrument was evaluated in January 1992 at a Superfund site under remediation. Results from the demonstration are presented in a peer-reviewed article entitled “Evaluation of Portable Gas Chromatographs” in the *Proceedings of the 1993 U.S. EPA/Air and Waste Management Association International Symposium*, VIP-33, Volume 2, 1993. A final report will not be prepared.

HNU GC 311D Portable Gas Chromatograph

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# HNU SYSTEMS, INC.
## (HNU Source Excited Fluorescence Analyzer-Portable [SEFA-P] X-Ray Fluorescence Analyzer)

## TECHNOLOGY DESCRIPTION:

HNU Systems, Inc. developed the Source Excited Fluorescence Analyzer - Portable (SEFA-P), a portable X-ray technology, to selectively determine metals concentrations in soils and other media at hazardous waste sites or industrial locations. Three excitation sources are offered with the SEFA-P X-ray fluorescence (XRF) Analyzer: Iron-55, Cadmium-109, and Americium-241. The SEFA-P is shown in the photograph below.

The SEFA-P in its most basic form consists of the following components: one main cabinet that encloses the sample chamber; the excitation sources; a liquid nitrogen-cooled Si(Li) detector; a preamplifier; spectrometer electronics; a multi-channel analyzer (MCA); and a battery charger. The internal battery can power the MCA for 8 hours. The MCA has an RS-232 interface that allows the SEFA-P to be externally controlled through a PC or laptop computer. The SEFA-P weighs approximately 50 pounds.

Source Excited Fluorescence Analyzer-Portable (SEFA-P) XRF Analyzer

The SEFA-P can be calibrated empirically or using the Compton ratio. Quantitative results for samples are displayed on the PC screen in units of parts per million. The SEFA-P only analyzes soil samples in the intrusive mode; soil samples are placed in sample cups prior to analysis. After calibrating the unit, analyzing quality control samples, and preparing samples, it is possible to analyze 30 to 50 samples in an 8- to 10-hour day.

The SEFA-P is sold with a general license, so the operator does not have to be specifically licensed in each state in which it is used. As of 1995, the SEFA-P retailed for approximately $45,000, depending on the options included. This price includes one in-house operational training course.

## WASTE APPLICABILITY:

The SEFA-P can detect elements from aluminum through uranium in soil or other media, such as those elements at mining and smelting sites, drum recycling facilities, or plating facilities. The instrument can provide real-time, on-site analytical results during field screening and remedial operations. XRF analysis is faster and more cost-effective compared to conventional laboratory analysis.

## STATUS:

The SEPA-A has been used at a number of Superfund sites across the country. A SITE demonstration of the SEFA-P was conducted in February 1995 and summarized in Technical Report No. EPA/600/R-97/144, dated March 1998. The instrument was used to identify and quantify concentrations of metals in soils. The report gives field-based method detection limits, accuracy, and precision data from the analysis of standard reference materials and performance evaluation samples. Comparability of the XRF results to an EPA-approved reference laboratory method was also assessed. The draft fourth update to SW-846 includes Method 6200, dated January 1998, which incorporates the results of the SITE demonstration.

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# HORIBA INSTRUMENTS, INC.
(Infrared Analysis)

## TECHNOLOGY DESCRIPTION:

The OCMA-350 developed by Horiba measures the oil content in water samples using infrared analysis. The OCMA-350 includes a single-beam, fixed-wavelength, nondispersive infrared filter-based spectrophotometer. Infrared radiation from a tungsten lamp is transmitted through a cylindrical, quartz cuvette containing a sample extract. The radiation that has passed through the extract enters a detector containing a filter that isolates analytical wavelengths in the 3400- to 3500-nanometer range.

During the demonstration, Horiba dried soil by adding anhydrous sodium sulfate. Extraction of petroleum hydrocarbons in a given soil sample was typically performed by adding 20 milliliters of Horiba's proprietary S-316 extraction solvent to 5 grams of the sample. The mixture was agitated using an ultrasonic mixer. The sample extract was decanted into a beaker through a filter-lined funnel, and then the filtrate was poured into a quartz cuvette. The cuvette was placed in the spectrophotometer, and the TPH concentration in milligrams per kilogram was read on the digital display. Periodically, Horiba recycled the extraction solvent using its model SR-300 solvent reclaimer.

## WASTE APPLICABILITY:

The OCMA-350 provides an analysis of the oil content in water samples. It is also able to evaluate the capabilities of semiconductor fabrication and precision machinery cleaning equipment, evaluate the properties of industrial process oil and the residual oil of polishing materials, as well as wastewater that has been adulterated with silt, sludge, and other suspended particles.

## STATUS:

In June 2000, the EPA conducted a field demonstration of the OCMA-350 and six other field measurement devices for TPH in soil. The performance and cost of the OCMA-350 were compared to those of an off-site laboratory reference method. A complete description of the demonstration and summary of its results are available in the "Innovative Technology Verification Report: Field Measurement Devices for Total Petroleum Hydrocarbons in Soil-Horiba Instruments Incorporated OCMA-350 Oil Content Analyzer" (EPA/600/R-01/089).

## DEMONSTRATION RESULTS:

The method detection limit for the OCMA-350 was determined to be 15.2 mg/kg. Seventy-eight of 107 results used to draw conclusions regarding whether the TPH concentration in a given sampling area or sample type exceeded a specific action level agreed with those of reference method. Of 102 results used to measure measurement bias, 64 were biased low, 38 were biased high. For soil environmental samples, the results were statistically the same as the reference method for four of the five sampling areas. The OCMA-350 exhibited similar overall precision to the reference method (RSD ranges were 1.5 to 20 percent and 5.5 to 18 percent for the OCMA-350 and the reference method, respectively). The OCMA-350 showed no response for interferents such as PCE, 1, 2, 4-trichlorobenzene, and soil spiked with humic acid. The mean response for MTBE, Stoddard solvent, and turpentine were 72.5, 86, and 85 percent, respectively. The OCMA-350 showed a three-fold increase in TPH results when the moisture content for weathered gasoline samples was increased, and a three-fold decrease when the moisture content of diesel soil samples was increased. Both the measurement time and cost compared well with those of the reference method.

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# IDETEK, INC.
## (formerly BINAX CORPORATION, ANTOX DIVISION)
## (Equate® Immunoassay)

## TECHNOLOGY DESCRIPTION:

The Equate® immunoassay (see photograph below) uses an anti-benzene, toluene, and xylene (BTX) polyclonal antibody to facilitate analysis of BTX in water. A hapten-enzyme conjugate mimics free BTX hydrocarbons and competes for binding to the polyclonal antibody immobilized on a test tube. After the test tube is washed to remove unbound conjugate, a substrate chromogen mixture is added and a colored enzymatic reaction product forms. The enzymatic reaction is stopped by adding a few drops of sulfuric acid, which colors the enzymatic product yellow.

As with other competitive enzyme-linked immunosorbent assays, the color intensity of the enzymatic product is inversely proportional to the sample analyte concentration. Each sample is run with a reference sample of deionized water. The optical density of the colored enzymatic product is read on a portable digital colorimeter equipped with a filter that passes light at a peak wavelength of 450 nanometers. The ratio of the sample to the reference optical density values is used to estimate the aromatic hydrocarbon level in the low parts per million (ppm) range. The test is sensitive to about 1 ppm and requires 5 to 10 minutes per analysis.

Equate® Immunoassay Kit

## WASTE APPLICABILITY:

The Equate® immunoassay is designed to measure BTX in water.

## STATUS:

The National Exposure Research Laboratory-Las Vegas evaluated several versions of the Equate® immunoassay. The evaluation focused on cross-reactivity and interference testing and on analysis of benzene, toluene, ethylbenzene, and xylene and gasoline standard curves.

As a preliminary field evaluation, the Equate® immunoassay was used to analyze in duplicate five well samples and a creek sample, both in the field and the laboratory. Confirmatory analysis was conducted using purge-and-trap gas chromatography with an electron-capture detector, in parallel with a photoionization detector.

A SITE demonstration of the Equate® immunoassay was conducted in 1992. Results from this demonstration were published in June 1994 in an EPA report entitled "Superfund Innovative Technology Evaluation (SITE) Program Evaluation Report for Antox BTX Water Screen (BTX Immunoassay)" (EPA/540/R-93/518).

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# METOREX, INC.
## (Field Portable X-Ray Fluorescence Analyzers)

## TECHNOLOGY DESCRIPTION:

Metorex, Inc. (Metorex), manufactures, sells, leases, and provides analytical and repair services for its X-MET line of field portable X-ray fluorescence (FPXRF) analyzers. The latest X-MET models in this series of instruments are the X-MET 920 and X-MET 2000 systems. The X-MET 920 series includes the X-MET 920-P and 920-MP. The X-MET analyzers are specifically calibrated for on-site or in situ hazardous waste analysis. These analyzers provide rapid, nondestructive measurements of inorganic contaminants in soil, thin film such as lead in paint, or water matrices.

Each X-MET 920 series analyzer is built from modules into systems based on customers' analytical and logistical needs. The X-MET PC System (XPCS) can either be built into the expansion slot of the computer or is provided as a standalone, battery-operated XPCS module for direct interface to a computer's RS-232 port.

The X-MET 920-P is equipped with either a solid state Si(Li) gas-filled proportional counter detector or the other new SIPS detector contained in a hand-held probe. The X-MET 920 MP is equipped with a gas-filled proportional counter detector contained in a hand-held probe.

The 920 X-MET, equipped with a Si(Li) detector, dual radioisotope sources, and a portable sealed computer, sells for $47,950. The X-MET 920 MP sells for $36,325 and the X-MET 2000 sells for $62,430. These prices include factory training for two people at the Metorex facility. The X-MET can also be leased from Metorex.

The basic analyzer configuration includes the PC, XRF software, XPCS, and the analysis probe with excitation source. The XPCS contains a 2,048-channel multichannel analyzer that collects, analyzes, and displays the X-ray pulse-height spectrum. The high-resolution Si(Li) detector is liquid-nitrogen cooled by a 0.5-liter dewar built into the probe. The gas-filled proportional detector and SIPS intrinsic silicon pin diode detector operates at ambient temperatures. Metorex offers iron-55, cadmium-109, and americium-241 radioisotope excitation sources. Dual source configurations are available.

The X-MET 940 was tested as a prototype, which evolved into the X-MET 2000. It is essentially the same instrument as the X-MET 920-P but has a smaller, lighter physical configuration.

The X-MET 2000 is a custom, miniaturized, field-hardened, battery-operated, DOS-based computer that is dedicated to field XRF application. The system uses a flash or electronic hard disk to provide extreme durability under field operating conditions. It is among the smallest, lightest commercially available FPXRF with the full range of analytical capabilities.

All software is menu driven. These instruments are factory-calibrated and can be field-calibrated using either empirical calibration (all probes) or standardless-fundamental parameters (FP). For the Si(Li) probe, empirical calibration requires a set of site-typical or analyzed site-specific samples for the initial calibration. FP calibration requires one certified standard. Metorex claims that 50 or more soil samples can be analyzed in an 8- to 10-hour day with intrusive sampling, rigorous sample preparation, and long measurement times (200 to 300 seconds per sample) and up to 200 samples per day with in situ screening and short (10 to 100 seconds per sample) measurement times. The 920 X-MET, equipped with a Si(Li) detector, dual radioisotope sources, and a portable sealed computer, sells for $47,950. The X-MET 920 MP sells for $36,325 and the X-MET 2000 sells for $62,430. These prices include factory training for two people at the Metorex facility. The X-MET can also be leased from Metorex.

## WASTE APPLICABILITY:

The X-MET 2000 technology is designed to identify more than 60 elements in soil or other matrices, such as those at mining and smelting sites, drum recycling facilities, or plating facilities. The instrument can provide real-time, on-site analytical results during field screening and remediation operations. FPXRF analysis is faster and more cost-effective compared to conventional laboratory analysis.

## STATUS:

The X-MET 920-P, 920-MP, and 940 were evaluated under the SITE Program in April 1995. The evaluation is summarized in technical reports EPA/600/R-97/146 for the 920-P and 940 and EPA/600/R-97/151 for the 920-MP, both dated March 1998. The instruments were used to identify and quantify concentrations of metals in soils. Evaluation of the results yielded field-based method detection limits, accuracy, and precision data from the analysis of standard reference materials and performance evaluation samples. Comparability of the FPXRF results to an EPA-approved reference laboratory method was also assessed. The draft fourth update to SW-846 includes Method 6200, dated January 1998, which incorporates the results of the SITE study.

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# MICROSENSOR SYSTEMS, INCORPORATED
## (MSI-301A Vapor Monitor)

## TECHNOLOGY DESCRIPTION:

The MSI-301A vapor monitor is a portable, temperature-controlled gas chromatograph with a highly selective surface acoustic wave detector and an on-board computer (see photograph below). The MSI-301A vapor monitor performs the following functions:

- Preconcentrates samples and uses scrubbed ambient air as a carrier gas
- Analyzes a limited group of preselected compounds, such as benzene, toluene, and xylenes, at part per billion levels
- Operates by battery and includes an RS-232 interface
- Operates automatically as a stationary sampler or manually as a mobile unit

## WASTE APPLICABILITY:

The MSI-301A vapor monitor can monitor many volatile organic compound emissions from hazardous waste sites and other sources before and during remediation. Some specific applications of the microsensor technology include OSHA compliance monitoring, environmental ambient air analysis, carbon bed breakthrough analysis, and industrial manufacturing area emission monitoring.


MSI-301A Vapor Monitor

## STATUS:

In January 1992, the MSI-301A vapor monitor was evaluated in the field at a Superfund site. Results from the demonstration are presented in a peer-reviewed article entitled "Evaluation of Portable Gas Chromatographs" in the *Proceedings of the 1993 U.S. EPA/Air and Waste Management Association International Symposium*, VIP-33, Volume 2, 1993.

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# MILLIPORE CORPORATION
## (EnviroGard™ PCP Immunoassay Test Kit)

## TECHNOLOGY DESCRIPTION:

The EnviroGard™ pentachlorophenol (PCP) immunoassay test kit, shown in the photograph below, rapidly analyzes soil and water samples at sites contaminated with PCP. The procedure is performed by adding a water or soil sample extract to test tubes coated with a specific antibody along with a PCP-enzyme conjugate. The PCP from the sample and the enzyme conjugate compete for immobilized anti-PCP antibody binding sites. After the initial competitive reaction, any unbound enzyme conjugate is washed from the tubes and a clear substrate is added. Any bound enzyme conjugate colors the clear substrate blue. A small portable photometer is used to measure the color intensity, which is inversely related to the concentration of the PCP in the original sample or calibrator solution.

The amount of color in the sample tubes is compared to calibrators corresponding to either 10 and 100 parts per million (ppm) for soil samples or 5 and 50 parts per billion (ppb) for water samples. Different detection levels can be achieved by diluting either the soil sample extract or the water sample.

The test kit has been tested for interferences with humic acids, pH, water content in soil samples, and oil co-contamination. Humic acid content in sample extracts greater than 10,000 ppb may cause false positive results. Samples with pH within the range of 4 to 14 were found to be correctly evaluated. The test kit correctly evaluated soils containing water up to 30 percent by weight, as well as samples containing water up to 10 percent by weight. Soil samples containing up to 10 percent oil were also correctly evaluated by the test kit.

EnviroGard™ PCP Immunoassay Test Kit

## WASTE APPLICABILITY:

The EnviroGard™ PCP test kit measures PCP in water samples and extracts of soil samples. Detection limits are 10 ppm for soil samples and 5 ppb for water samples.

## STATUS:

The EnviroGard™ PCP test kit was used to screen and quantify PCP contamination in soil and groundwater during a SITE demonstration in Morrisville, North Carolina in August 1993. The PCP carrier used at this site was a mixture of isopropyl ether and butane. In addition, soil and groundwater samples collected from a wood-preserving site in Winona, Missouri were tested during the demonstration. Diesel fuel was used as the PCP carrier at this site.

The test kit did not meet acceptable accuracy requirements during the demonstration. Millipore has since developed a revised protocol for PCP analysis. Millipore believes the revised protocol improves the accuracy and reproducibility of the test.

The Innovative Technology Evaluation Report (EPA/540/R-95/514), which details results from the demonstration, is available from EPA.

The EnviroGard™ PCP test kit has been accepted by the EPA Office of Solid Waste for inclusion in SW-846 as Method 4010A.

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# NITON CORPORATION
## (XL Spectrum Analyzer)

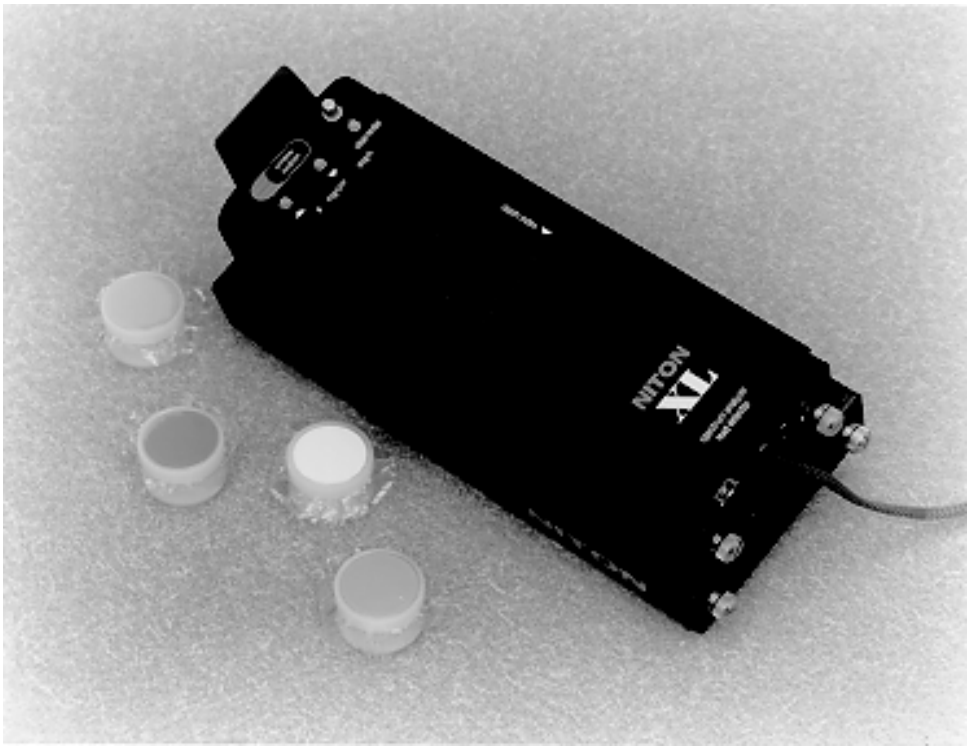
## TECHNOLOGY DESCRIPTION:

NITON Corporation (Niton) manufactures and services the XL Spectrum Analyzer, the XL-309 Lead Detector, the XL-700 Series multi-element analyzers, and the XL-800 Series alloy analyzers. All are hand-held, field portable X-ray fluorescence (FPXRF) instruments.

The XL Spectrum Analyzer allows in situ and prepared-sample, on-site measurement of lead in paint, soils, dust wipes, coatings and air. Lead paint analysis is accepted by EPA, and NIOSH Method 7702 is in place for airborne lead analysis. The XL-700 Series is the multi-element analyzer. This instrument analyzes many elements, including all eight RCRA metals, in soils, filter media, and coatings (see photograph below).

The NITON XL-309 lead detector includes a cadmium-109 radioactive source (up to 40 millicurie) that provides the excitation energy that produces characteristic fluorescent X-rays from a sample The XL-700 Series can be equipped with a cadmium-109 source, an Iron-55 source, an americium-241 source, or all three. All XL-309 instruments can be upgraded to any XL-700 Series instrument at any time. The XL-800 Series alloy analyzers are designed for rapid sorting and chemical identification of metal alloys and scrap metals.

The instrument includes a silicon Pin-diode detector (or a silicon diode plus cadmium-zinc-telluride detector for lead paint analysis), cooled by the thermoelectric Peltier effect. The instrument also includes (1) a multichannel analyzer of 1,024 channels, (2) an RS-232 serial port for data transfer and printing, (3) an internal memory for storing up to 1,000 readings with spectra, and (4) a back-lit graphic liquid crystal display.




XL Spectrum Analyzer

The instrument self-calibrates its energy scale and uses a Compton backscatter calibration technique for soil testing. The backscatter calibration compensates for X-ray absorption in the soil matrix. Alloy analysis is performed using fundamental parameters. The instrument is equipped with a removable lithium ion rechargeable battery that provides up to 8 hours of continuous use. It can analyze 20 to 25 samples per hour, based on a 60-second analysis time and minimal sample preparation.

The complete instrument, shown in the photograph above, weighs less than 3 pounds. NITON requires a 1-day operator training and radiation safety course which is offered at no charge. The course awards a certification maintenance point to Certified Industrial Hygienists who attend. NITON manufactures the Spectrum Analyzers under both general and specific licenses with the State of Rhode Island.

Instrument costs range between $14,000 and $37,000, depending on number of applications and radioactive sources. Prices include two rechargeable batteries and a charger, automotive power adapter, cable for serial data downloading, waterproof carrying case, operating and safety manual, barcode wand, personal computer software, all necessary hardware accessories and calibration check standards, and a 15-month warranty.

## WASTE APPLICABILITY:

The NITON Spectrum Analyzer can detect more than 20 elements in soil samples, such as those obtained from lead-contaminated residences, mining and smelting sites, drum recycling facilities, and plating facilities.

The instrument can provide real-time, on-site analytical results during field screening and remediation operations. FPXRF analysis is faster and more cost effective compared to laboratory analysis.

## STATUS:

The NITON Spectrum Analyzer was demonstrated under the SITE Program in April 1995. The results are summarized in Technical Report No. EPA/600/R-97/150, dated March 1998. The instrument was used to identify and quantify concentrations of metals in soils. A preliminary evaluation of the results yielded field-based method detection limits, accuracy, and precision data from the analysis of standard reference materials and performance evaluation samples. Detectors have improved, so detection limits of current instruments are lower than those determine in the 1995 site demonstration. Comparability of the FPXRF results to an EPA-approved reference laboratory method was also assessed. The Draft Fourth Update to SW-846 includes Method 6200, dated January 1998, which is based on this work.

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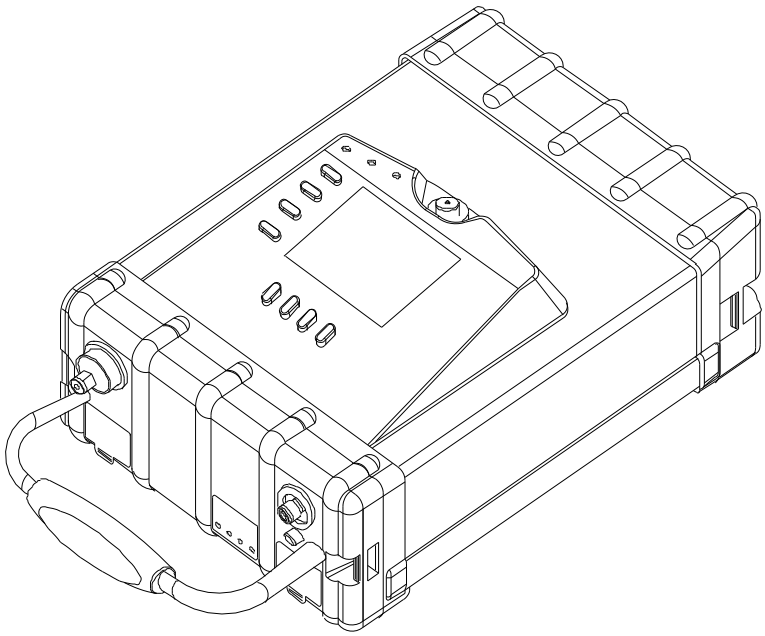
# PE PHOTOVAC INTERNATIONAL, INC.
## (formerly PHOTOVAC INTERNATIONAL, INC.)
## (PE Photovac Voyager Portable Gas Chromatograph)

## TECHNOLOGY DESCRIPTION:

The PE Photovac Voyager Portable Gas Chromatograph (GC) is a lightweight, battery powered, isothermal GC (see figure below). The Voyager GC is designed to replace the Photovac 10S Plus GC and incorporates the following advanced features:

- A miniature analytical engine containing a precolumn with backflush capability; three analytical columns dedicated for "light", "middle", and "heavy" compounds; an isothermal oven with an operating temperature range of 30-80 °C; a miniature all-stainless steel valve array; and a syringe/valve injection port. The whole engine is maintained at the set isothermal temperature.
- The Voyager photoionization detector (PID) provides superior sensitivity to volatile organic compounds (VOC) such as benzene, toluene, xylenes, and chlorinated ethylenes.
- High sensitivity to chlorinated compounds is achieved using a Voyager equipped with an electron capture detector (ECD).
- A VOC function acts as a fast screening tool for pre-GC analysis; the VOC mode supports either syringe or automatic "sample injections."
- A factory-programmed assay for analysis of up to 40 VOCs listed in EPA Method 601, 602, 624, and 8260.
- A "simplified" operating mode designed to detect a subset of VOCs selected from the preprogrammed assay.
- A user mode, simple point-and-press operation, to analyze preselected compounds from the factory programmed assay.
- Total weight with PID is 15 pounds.



PE-Photovac Portable Gas Chromatograph

## WASTE APPLICABILITY:

The Voyager GC can monitor VOC emissions from hazardous waste sites and other emission sources before, during, and after remediation. PC Sitechart LX software provides the user with data downloading, integration and GC customization capabilities. This enables a user to generate data onsite, with confidence.

## STATUS:

The Photovac 10S PLUS GC was evaluated in January 1992 at a Superfund site under remediation. Results from this demonstration are presented in a peer-reviewed article entitled "Evaluation of Portable Gas Chromatographs" in the *Proceedings of the 1993 U.S. EPA/Air and Waste Management Association International Symposium*, VIP-33, Volume 2, 1993.

The Voyager GC was evaluated during a field study in August 1995. During the study, downwind vapors from an artificial source generator were analyzed. Preliminary results of the demonstration were presented in an article titled "Performance Comparison of Field-Deployable Gas Chromatographs with Canister TO-14 Analyses" in the *Proceeding of the 1996 U.S. EPA/Air and Waste Management Association International Symposium*, VIP-64, 1996.

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# QUADREL SERVICES, INC.
## (Emflux® Soil-Gas Survey System)

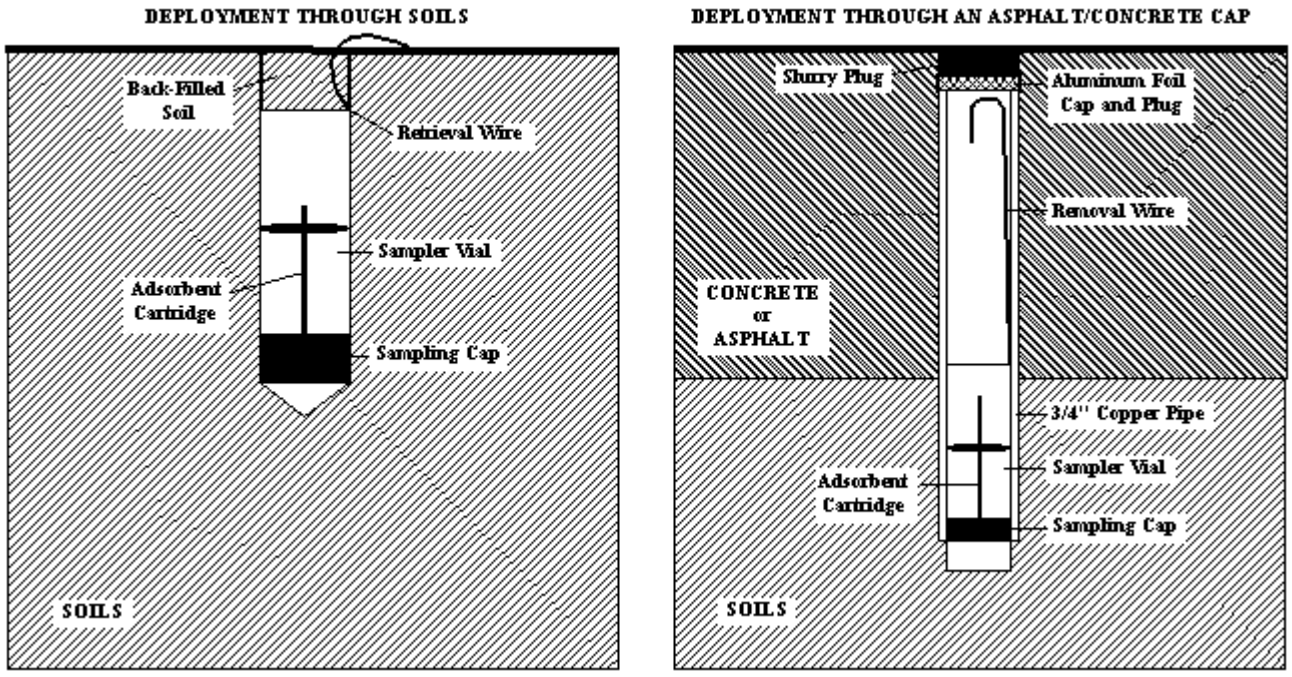
## TECHNOLOGY DESCRIPTION:

Quadrel's EMFLUX® System is a fully operational, passive, near-surface investigative technology capable of identifying buried VOCs and SVOCs at concentrations in the low parts-per-billion range.

EMFLUX® exploits the crustal effects of gravity (generally referred to as "earth tides") through a predictive computer model. These geophysical forces dominate vertical soil-gas velocities, increasing them by three to five orders of magnitude. The ability to predict such velocity changes (which dwarf influences of barometric pressure, temperature, moisture, and other phenomena) allows EMFLUX® to take advantage of maximum gas emissions at ground surface through simultaneous, cumulative sampling, thereby enhancing detection accuracy and survey reliability. As a result, EMFLUX® survey results are reproducible in excess of 90 percent of the time in terms of both correct identification of individual VOCs and SVOCs and proportional duplication at ground surface of changes in subsurface concentrations of targeted compounds.

Deployment, by individuals or two-person teams, takes less than two minutes per point (exclusive of initial sample location surveying); retrieval requires half that time; and collectors remain in the field for 72 hours. Field components of the system (9-inch stainless steel shells used above ground, or 3.5-inch glass vials for shallow subsurface placement) are completely portable. Available analytical methods range from EPA Methods 8020 and 8021, using gas chromatography and a variety of detectors, to Methods 8260 and 8270, using mass spectrometry.

EMFLUX ® COLLECTOR



## WASTE APPLICABILITY:

The EMFLUX® System has been employed with great effectiveness in detecting a broad range of VOCs and SVOCs (from vinyl chloride through hexachlorobutadiene) in soil, groundwater and air. The technology has also been successful in identifying and mapping methane, non-methane landfill gases, mercury, certain types of high explosives, and chemical surety materials.

## STATUS:

Quadrel participated in the SITE Program (Environmental Technology Verification Program) in May and June 1997, when EMFLUX® was deployed at two sites (one in Colorado, the other in Iowa) to detect, among other VOCs, vinyl chloride, 1,2-DCE, 1,1-DCA, 1,1,1-TCA, TCE and PCE. The demonstration results indicate that the EMFLUX® system can provide useful, cost-effective data for environmental problem-solving. The EMFLUX® system successfully collected soil gas samples in clay and sandy soils. The sampler provided positive identification of target VOCs and may be able to detect lower concentrations of VOCs in the soil gas than the reference method. The results of the demonstration did not indicate consistent proportional comparability between the EMFLUX® data and the reference method's data. Currently, the final report and verification statement is being completed by the National Risk Management Research Laboratory in Las Vegas, Nevada. The EMFLUX® system has been commercially operational since 1990. EMFLUX® has been used on 350 major projects in 46 U.S. states, in Guam, Canada, Great Britain, South America, Poland, and the Czech Republic.

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# RADIOMETER AMERICAN
## (Anodic Stripping Voltammetry for Mercury in Soil)

## TECHNOLOGY DESCRIPTION:

The Radiometer Analytical Group (Radiometer) anodic stripping voltammetry (ASV) method is a field-portable technique that uses a programmed electrochemical apparatus to measure total mercury in soil and sediment. The Radiometer method is more complex than immunoassay methods, but it can generate quantitative results, while immunoassay methods generate only semiquantitative or screening level results. Each Radiometer ASV apparatus can analyze up to about 40 samples per day for mercury.

Mercury in soil or sediment samples is first extracted using a heated 1:6:17 mixture of hydrochloric acid, nitric acid, and deionized water. The extract is then cooled, buffered, and centrifuged. The extracted samples are then analyzed by ASV using a Radiometer PSU 20 unit.

The ASV method has two steps. In the first step, mercury ions are plated out of solution onto a glassy carbon electrode that is coated with a gold film and placed under a negative potential. In the second step, the negative potential is removed and the mercury is stripped off the electrode. The change in electrode potential is measured with a high impedance voltmeter and is proportional to the mercury concentration.

## WASTE APPLICABILITY:

The Radiometer method has been used to analyze soil and sediment samples containing mercury. The effect of soil texture on this method's performance is unknown. Soil moisture content of up to 31 percent had minimal to no effect on performance. The ASV method can measure mercury in soil or sediment at the parts per million (ppm) level.

## STATUS:

The Radiometer ASV method was field demonstrated in August 1995 at two southwestern state sites: the Carson River Mercury site in Reno, Nevada; and the Sulphur Bank Mercury Mine site in Clear Lake, California. During the demonstration, the method was used to analyze 145 samples (55 samples from each site and 35 archived samples), 20 field duplicate samples, 17 weak digestion samples, and 13 performance evaluation samples. Duplicate samples underwent confirmatory analysis using inductively coupled plasma with mass spectrometry (ICP-MS) at an off-site laboratory. The ASV method provided reproducible quantitative results comparable to those generated by ICP-MS down to 2 ppm. Additional results from the field demonstration will be available in the Innovative Technology Evaluation Report. According to Radiometer, the PSU 20 unit has been improved to achieve detection limits at the parts per billion level (Radiometer PSU 22 unit).

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# SCITEC CORPORATION
## (Metal Analysis Probe [MAP®] Portable Assayer]

## TECHNOLOGY DESCRIPTION:

The SCITEC Corporation MAP® Portable Assayer (see photograph below) is a field portable X-ray fluorescence (FPXRF) analyzer. This FPXRF analyzer can simultaneously analyze for select metals. It is compact, lightweight, and does not require liquid nitrogen. A rechargeable battery allows the FPXRF analyzer to be used at remote sites where electricity is unavailable.

The MAP® Portable Assayer uses a silicon X-ray detector to provide elemental resolution. The unit demonstrated under the SITE Program used a Cadmium-109 radioisotope as the excitation source.

The MAP® Portable Assayer provides high sample throughput and is reportedly easy to operate. Analytical results obtained by this instrument may be comparable to the results obtained by EPA-approved methods.

The instrument is composed of a control console connected to an ambient scanner with a cable. The basic MAP® system also includes a carry pack, rechargeable batteries, operator's manual, target metal standard, and a shipping case. The control console contains a 256-multichannel analyzer (MCA) with a storage capacity of 325 spectra and analyses. The control console weighs 7 pounds and the ambient scanner weighs about 2.5 pounds.

The MAP® Portable Assayer is capable of analyzing 70 samples in an 8- to 10-hour day based on a 240-second analysis time. The instrument is empirically calibrated by the developer. SCITEC requires a 1-day operator training and radiation safety course prior to obtaining a specific license to operate the instrument. The standard MAP® Portable Assayer package sells for $15,590.


MAP® Portable Assayer

## WASTE APPLICABILITY:

The MAP® Portable Assayer can detect select metals in soil and sediment samples and in filter and wipe samples. It can also detect lead in paint. The MAP® Portable Assayer reportedly can quantitate metals at concentrations ranging from parts per million to percentage levels.

## STATUS:

The MAP® Portable Assayer has been used at a number of Superfund sites across the country. It was evaluated in April 1995 as part of a SITE demonstration of FPXRF instruments. The instrument was used to identify and quantify concentrations of metals in soils. A preliminary evaluation of the results yielded field-based method detection limits, accuracy, and precision data from the analysis of standard reference materials and performance evaluation samples.

Comparability of the FPXRF results to an EPA-approved reference analytical method was also assessed during the demonstration. An EPA SW-846 method for FPXRF analysis of soils was published in 1996. A comprehensive evaluation of all results was presented in a technical report from EPA in 1997.

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# SENTEX SENSING TECHNOLOGY, INC.
## (Scentograph Plus II Portable Gas Chromatograph)

## TECHNOLOGY DESCRIPTION:

The Scentograph Plus II Portable Gas Chromatograph is designed to monitor volatile organic compound (VOC) emissions from hazardous waste sites and other emission sources. It operates by drawing air through a sorbent bed, followed by rapid thermal desorption into the carrier stream. The instrument operates in either Micro Argon Ionization or Micro Electron Capture modes.

The Scentograph Plus II Portable Gas Chromatograph can operate for several hours on internal batteries and has internal carrier gas and calibration tanks. It can be fitted with capillary columns (up to 105 meters, 0.32 or 0.53 millimeter) or packed columns.

The instrument can be operated isothermally at temperatures ranging from ambient to 179°C. Oven temperatures can be programmed at a desired rate. The 11.7- electron-volt ionization energy allows a detection limit of about 0.1 part per billion. The instrument is controlled by a detachable IBM compatible laptop computer (see photograph below). Purge and Trap Accessories enable on-site, on-line determinations of various VOCs in water.

## WASTE APPLICABILITY:

The Scentograph Plus II portable gas chromatograph can monitor VOC emissions from hazardous waste sites and other emission sources.A newly developed situ probe allows in situ purge and trap operation, which eliminates the need for water filtration or pre-treatment prior to analysis. This application is specifically suited for wastewater.

Scentograph Plus II Portable Gas Chromatograph

## STATUS:

The Scentograph Plus II portable gas chromatograph was evaluated in January 1992 at a Superfund site under remediation. Results from this demonstration are presented in a peer-reviewed article titled "Evaluation of Portable Gas Chromatographs" in the *Proceedings of the 1993 U.S. EPA/Air and Waste Management Association International Symposium*, VIP-33, Volume 2, 1993.

The technology was also evaluated in June 1994 at a landfill adjacent to a residential area. Results from this demonstration are presented in a peer-reviewed article titled "On-Site Monitoring of Vinyl Chloride at Parts Per Trillion Levels in Air" in the *Proceedings of the 1995 U.S. EPA/Air and Waste Management Association International Symposium*, VIP-47, Volume 1, 1995.

The Scentograph Plus II portable gas chromatograph was also evaluated during a field study in August 1995. During the study, downwind vapors from an artificial source generator were analyzed. Preliminary results of the demonstration were presented in an article titled "Performance Comparison of Field-Deployable Gas Chromatographs with Canister TO-14 Analyses" in the *Proceeding of the 1996 U.S. EPA/Air and Waste Management Association International Symposium*, VIP-64, 1996. The Scentograph Plus II was also evaluated under an ETV program report published in November of 1998 titled "Environmental Technology Verification Report: Portable Gas Chromatograph, Sentex Systems, Inc. Sentograph Plus II." This document can be obtained from the EPA, technical report number EPA/600/R-98/145.

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## STATUS:

The SimulProbe® core barrel sampler was demonstrated under the Superfund Innovative Technology Evaluation (SITE) program in May and June 1997 at two sites: the Small Business Administration (SBA) site in Albert City, Iowa, and the Chemical Sales Company (CSC) site in Denver, Colorado. Samples collected during the demonstrations were analyzed for VOCs to evaluate the performance of the samplers.

Demonstration results indicate that the core barrel sampler had higher sample recoveries and yielded samples with higher VOC concentrations in the clayey soil present at the SBA site than the standard methods. Conversely, the sampler had lower recoveries and yielded samples with lower VOC concentrations than the standard methods in the sandy soil present at the CSC site. Sample integrity using the core barrel sampler was not preserved in highly contaminated soil, and the use of sample liners was found to be required to preserve sample integrity. The core barrel sampler's reliability and throughput were not as good as those of the standard methods; however, the developer claims that the sampler used during the demonstrations was incorrectly manufactured. Costs for the core barrel sampler were lower than costs related to the standard sampling method.

Demonstration results are documented in the "Environmental Technology Verification" report for the sampler dated August 1998 (EPA/600/R-98/094).

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# SITE-LAB CORPORATION
## (Ultraviolet Fluorescence Spectrometer)

## TECHNOLOGY DESCRIPTION:

The UVF-3100A includes a portable fluorometer fitted with excitation and emission filters that are appropriate for TPH analysis of soil samples. The fluorometer uses a mercury vapor lamp as its light source. Light from the lamp is directed through an excitation filter before it irradiates a sample extract held in a quartz cuvette. The UVF-3100A can separately measure gasoline range organic (GRO) and extended diesel range organic (EDRO) components of sample extracts. Depending on the analysis being conducted (for example DRO analysis), the fluorometer is fitted with an appropriate emission filter that corresponds to the wavelength at which the sample extract is expected to fluoresce. For GRO, an emission filter with a bandwidth of between 275 and 285 nanometers is used, and for EDRO, an emission filter with a bandwidth of between 300 and 400 nanometers is used.

## WASTE APPLICABILITY:

Sitelab's portable ultraviolet fluorescence (UVF) technology specifically measures aromatic contaminants, including TPH fuel oils, PAHs, BTEXs and PCBs. Sitelab also tests aromatic fractions found in Volatile Petroleum Hydrocarbons (VPH), Gasoline Range Organics (GRO), Extractable Petroleum Hydrocarbons (EPH) and Diesel Range Organics (DRO), required by many federal and state regulatory agencies for assessing and cleaning up petroleum sites.

## STATUS:

In June 2000, the EPA conducted a field demonstration of the UVF-3100A and six other field measurement devices for TPH in soil. The performance and cost of the UVF-3100A were compared to those of an off-site laboratory reference method. A complete description of the demonstration and summary of its results are available in the "Innovative Technology Verification Report: Field Measurement Devices for Total Petroleum Hydrocarbons in Soil-siteLAB® Corporation Analytical Test Kit UVF-3100A" (EPA/600/R-01/080).

## DEMONSTRATION RESULTS:

The method detection limit for the UVF-3100A was determined to be 3.4 mg/kg. Eighty-seven of 108 results used to draw conclusions regarding whether the TPH concentration in a given sampling area or sample type exceeded a specific action level agreed with those of reference method. Of 102 results used to measure measurement bias, 69 were biased low, 33 were biased high. For soil environmental samples, the results were statistically the same as the reference method for one of the five sampling areas. The UVF-3100A exhibited similar overall precision to the reference method (RSD ranges were 3 to 16 percent and 5.5 to 18 percent for the UVF-3100A and the reference method, respectively). The UVF-3100A showed a mean response of less than 5 percent for interferents such as MTBE, PCE, Stoddard solvent, turpentine, 1, 2, 4-trichlorobenzene, and soil spiked with humic acid. The UVF-3100A showed a statistically significant increase in TPH results (15 percent) when the moisture content was increased. Both the measurement time and cost compared well with those of the reference method.

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# SPACE AND NAVAL WARFARE SYSTEMS CENTER
## (SCAPS Cone Penetrometer)

## TECHNOLOGY DESCRIPTION:

The Site Characterization and Analysis Penetrometer System (SCAPS) was developed by the space and naval warfare systems center. SCAPS is mounted on a cone penetrometer testing (CPT) platform for field use; it can be fitted with a laser-induced fluorescence (LIF) sensor to provide in situ field screening of petroleum hydrocarbons in subsurface soils. CPT technology has been widely used in the geotechnical industry for determining soil strength and soil type from measurements of tip resistance and sleeve friction on an instrumented probe. The SCAPS CPT platform equipped with LIF sensors can provide real-time field screening of the physical characteristics of soil and chemical characteristics of petroleum hydrocarbon contamination at hazardous waste sites.

SCAPS is primarily designed to quickly and cost-effectively distinguish hydrocarbon-contaminated areas from uncontaminated areas. SCAPS also provides geologic information and reduces the amount of investigation-derived waste. This capability allows further investigation and remediation decisions to be made more efficiently and reduces the number of samples that must be submitted for laboratory analysis.

The LIF system uses a pulsed laser coupled with an optical detector to measure fluorescence through optical fibers. Fluorescence is measured through a sapphire window on a probe that is pushed into the ground with a truck-mounted CPT. LIF provides data on the in situ distribution of petroleum hydrocarbons, measured by the fluorescence response induced in the polynuclear aromatic hydrocarbons (PAH) that comprise the petroleum hydrocarbon. LIF detects PAHs in the bulk soil matrix throughout the vadose, capillary fringe, and saturated zones. LIF also provides a detect-nondetect field screening capability relative to a specified detection limit derived for a specific fuel product on a site-specific soil matrix. In addition, LIF provides qualitative data derived from spectrographic data at depths up to 150 feet.

## WASTE APPLICABILITY:

SCAPS CPT technology equipped with LIF sensors can provide real-time qualitative analysis of subsurface soils. This technology may be useful in screening soils at oil refineries, tank farms, and shipyards. The combined technologies provide substantial cost savings and quicker analyses compared to conventional laboratories.

## STATUS:

The SCAPS CPT and LIF technologies were demonstrated at two hydrogeologically distinct field sites under the SITE Characterization and Monitoring Program. The demonstrations were conducted at the Hydrocarbon National Test Site at the Naval Construction Battalion Center in Port Hueneme, California in May 1995, and the Steam Plant Tank Farm, Sandia National Laboratories in Albuquerque, New Mexico in November 1995. An Innovative Technology Evaluation Report (ITER) (EPA/540/R-95/520) was published by EPA.

The SCAPS project is meeting the Navy's goals of (1) expedited development and regulatory acceptance, (2) performance of urgently needed petroleum, oil, and lubricant (POL) field screening at Navy facilities, and (3) technology transfer to industry for widespread use. The SCAPS LIF technology is certified and verified. The technology has matured to become a platform with state-of-the-art sensor technology and a suite of the latest CPT tools for sampling and direct push well installations. On August 5, 1996, the California EPA Department of Toxic Substance Control certified the SCAPS LIF as a site characterization technology for real-time, in situ subsurface field screening for POL contaminants, pursuant to California Health and Safety Code, Section 25200.1.5.

Three SCAPS units are performing POL field screenings at Navy facilities on a prioritized basis. These screenings include plume chasing and plume edge delineation on a finer scale than has been feasible in the past.

## DEMONSTRATION RESULTS:

The results of the SCAPS demonstrations at Port Hueneme and Sandia National Laboratories were presented in the ITER and are summarized below:

- SCAPS met the demonstration objective of providing real-time screening of the physical characteristics of soil and chemical characteristics of petroleum hydrocarbon contamination.
- SCAPS achieved better than 90 percent agreement with the discrete soil samples and analytical results.
- SCAPS is capable of mapping the relative magnitude and the vertical and horizontal extent of subsurface fluorescent petroleum hydrocarbon contaminant plumes in soil and groundwater.

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# SRI INSTRUMENTS
## (Compact Gas Chromatograph)

## TECHNOLOGY DESCRIPTION:

The SRI Instruments (SRI) line of compact single- and dual-oven portable gas chromatographs (GC) are designed for on-site and laboratory analysis of organic compounds in soil, water, air, and other matrices. SRI GCs are equipped with ambient-to-400ºC programmable column ovens and electronic pressure/pneumatic control (EPC) of all system gases. These GCs include built-in, serially interfaced (RS-232) data acquisition unit that permits use of desktop, notebook, and palmtop PCs and software versions for Windows 3.11/Windows NT 4.00, and Windows '95/'98 (Y2K compliant). SRI GCs are equipped with a standard on-column injection port that accepts packed and capillary columns, and systems may be equipped with multiple injectors and detectors for series or independent operation, as required by the application. Automated gas sampling, split/splitless injection, Method 5035/5030 compliant purge-and-trap concentration, and liquid autosampling carousels are available as options. SRI also manufactures external detector units that may be connected to other host GCs by means of a heated transfer line (provided), or used in stand-alone monitoring applications such as continuous monitoring of stack THC emissions and chlorinated compounds.

## WASTE APPLICABILITY:

The SRI GCs can monitor airborne emissions from hazardous waste sites and other emission sources before, during, and after remediation. They can also analyze soil, water, and gas samples for organic contaminants such as benzene, toluene, ethylbenzene, xylene, polychlorinated biphenyls, and pesticides. Their performance characteristics in the field have been proven by a large private, commercial, and government user base.

## STATUS:

The SRI model 8610 GC was evaluated in January 1992 at a Superfund site under remediation. Results from this demonstration are presented in a peer-reviewed article entitled "Evaluation of Portable Gas Chromatographs" in the *Proceedings of the 1993 U.S. EPA/Air and Waste Management Association International Symposium*, VIP-33, Volume 2, 1993.

Compact Gas Chromatograph

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# STRATEGIC DIAGNOSTICS, INC.
## (formerly ENSYS ENVIRONMENTAL PRODUCTS, INC.)
## (EnSys Penta Test System)

## TECHNOLOGY DESCRIPTION:

The EnSys Penta Test System is designed to quickly provide semiquantitative results for pentachlorophenol (PCP) in soil samples. The system is shown in the photograph below. The technology uses immunoassay chemistry to produce compound-specific reactions that detect and quantify PCP. Polyclonal antibodies are fixed to the inside wall of a test tube, where they offer binding sites for PCP. An enzyme conjugate containing a PCP derivative is added to the test tube to compete with sample PCP for antibody binding sites. Excess sample and enzyme conjugate are washed from the test tube. Reagents are then added to the test tube to react with the enzyme conjugate, forming a color. After a designated time period, a solution is added to the test tube to stop color formation. The sample color is compared to the color formed by a PCP standard. A differential photometer compares the colors. The results obtained from soil samples are compared against a standard to determine the detection levels.

The system can be affected by extremes of naturally occurring matrix effects such as humic acids, pH, or salinity. Site-specific matrix effects that can affect the system include PCP carriers such as petroleum hydrocarbons or solvents; and other chemicals used in conjunction with PCP, including creosote, copper-chromium-arsenate, or herbicides. Specific chemicals similar in structure to PCP can provide positive results, or cross reactivity.

## WASTE APPLICABILITY:

The PCP immunoassay measures PCP concentrations in soil. For semiquantitative soil analysis, the concentration ranges are as follows: greater than 50 parts per million (ppm), between 50 and 5 ppm, between 5 and 0.5 ppm, and less than 0.5 ppm. These ranges can be customized to a user's needs.


EnSys Penta Test System

## STATUS:

The SITE demonstration occurred in summer 1993 at Morrisville, North Carolina. Samples collected from Winona, Missouri were transported to the demonstration location for testing. Samples from both sites were analyzed to evaluate the effects of different sample matrices and of different PCP carriers such as diesel fuel and isopropyl ether-butane. During the demonstration, the PENTA RISc Test System analyzed 112 soil samples and 16 water samples. The Innovative Technology Evaluation Report (EPA/540/R-95/514), which details results from the demonstration, is available from EPA.

The PENTA RISc Test System has been accepted under Solid Waste Method 4010 (SW-846, third edition, second update). In the 4 years that it has been available, more than 12,000 immunoassay-based tests have been used on wood preserving sites.

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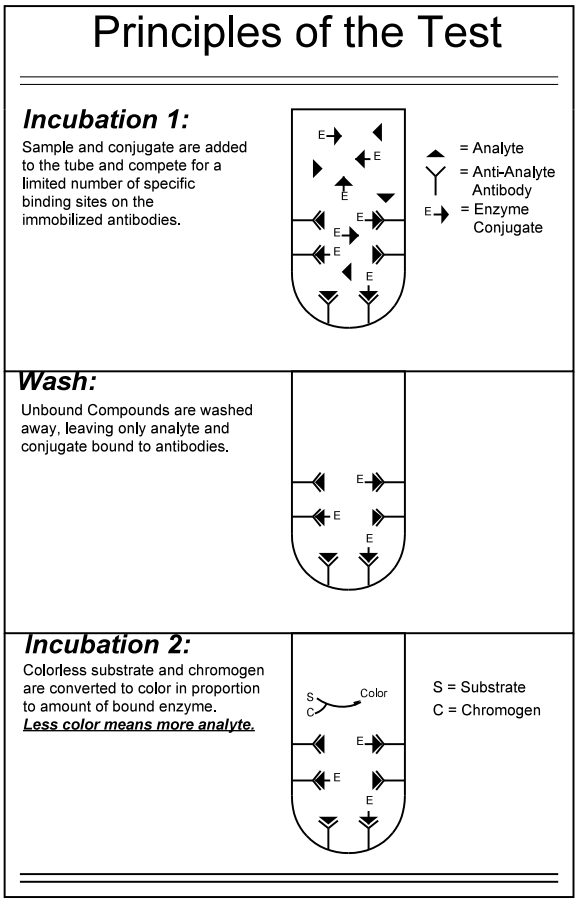
# STRATEGIC DIAGNOSTICS INC.
## (EnviroGard™ PCB Immunoassay Test Kit)

## TECHNOLOGY DESCRIPTION:

The EnviroGard™ polychlorinated biphenyl (PCB) immunoassay test kit rapidly analyzes for PCB concentrations in samples of soil or sediment. Soil sample extracts are prepared using the EnviroGard™ Soil Extraction Kit and methanol. These extracts and assay calibration solutions are added to plastic test tubes coated with antibodies. Thereafter, PCB-enzyme conjugate is added to each test tube. The test tubes then stand for 15 minutes. The antibodies in each test tube bind with either PCB molecules or enzyme conjugate. Next, the tubes are washed to remove any material not bound to the antibodies. A clear substrate/chromogen solution is then added to each tube, and the tubes are allowed to stand for 5 minutes. Any enzyme conjugate bound to the tubes colors the clear substrate blue. A deeper shade of blue in the test tube indicates a lower PCB concentration. The color intensity in the test tubes is measured at 450 nanometers using a small portable photometer. The color intensity is compared to one or more of the four calibrator solutions included in the kit to yield data allowing classification above or below 1, 5, 10, or 50 parts per million (ppm). Using this technology up to 18 sample extracts can be analyzed in less than 30 minutes. Millipore Corporation (Millipore) can provide optional protocols for quantitative analysis of specific Aroclors or for testing sediment, water, or soil samples.




Test Kit Procedure

## WASTE APPLICABILITY:

The EnviroGard™ PCB test kit measures PCB concentrations in soil or sediment. The test is calibrated to screen for Aroclors 1016, 1232, 1242, 1248, 1254, and 1260 at greater than 95 percent confidence interval.

In 1991, the EnviroGard™ PCB test kit was used to screen and quantify PCB contamination in soils at a SITE demonstration of a solvent extraction system in Washburn, Maine.

Soil containing over 50 ppm PCB was required for the demonstration at the Washburn, Maine site. Calibrators at the 5 and 50 ppm level were used to evaluate the test kit's potential for segregating soils. Additional tests were performed on dilutions of the soil extracts to evaluate quantitative performance. Highly contaminated soils were easily identified, and quantitative tests provided correlation to contaminant levels obtained by off-site laboratory analysis using EPA Method 8080. The Innovative Technology Evaluation Report (EPA/540/R-95/517) for this study is available from the EPA.

The kit was also demonstrated at a U.S. Department of Energy (DOE) site in Kansas City, Missouri. Soils contaminated with Aroclor 1242 in ranges from nondetectable to greater than 1,000 ppm were analyzed with the test kit at the DOE facility. Over 200 assays of environmental samples and calibrators were performed to evaluate correlation with both on-site and off-site laboratory gas chromatograph data. Final evaluation of the data will be presented in the Technology Evaluation Report.

The EnviroGard™ PCB test kit has been accepted by the EPA Office of Solid Waste for inclusion in SW-846 as Method 4020.

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# STRATEGIC DIAGNOSTICS, INC.
## (Immunoassay and Colorimetry)

## TECHNOLOGY DESCRIPTION:

The EnSys Petro Test System manufactured by SDI is based on a combination of immunoassay (specifically, enzyme-linked immunosorbent assay) and colorimetry. The EnSys Petro Test System includes the SDA Sample Extraction Kit, the EnSys Petro 12T Soil Test Kit, and the EnSys/EnviroGard® Common Accessory Kit. With this device, methanol is used for extraction of petroleum hydrocarbons from soil samples. Each sample extract is mixed with an enzyme conjugate solution. The reaction mixture is then transferred to an antibody-coated test tube. The hydrocarbons in the soil extract and those in the enzyme conjugate competitively bind to specific antibody sites on the test tube. The test tube is rinsed with a dilute detergent solution to remove any enzyme conjugate and hydrocarbons not bound to the antibodies. A color developer solution and hydrogen peroxide are added to the test tube in order to give yellow color to the enzymes that remain attached to the test tube. The color intensity is inversely proportional to the concentration of hydrocarbons in the extract. To accomplish color measurement, the absorbance of the antibody-coated tube containing the sample extract and an antibody-coated tube containing a reference standard (m-xylene) is compared using a differential photometer. A positive reading on the photometer indicates that the total concentration of petroleum hydrocarbons in the sample extract is less than that in the reference standard. Similarly, a negative reading on the photometer indicates that the total concentration of petroleum hydrocarbons in the sample extract is greater than that in the reference standard.

## WASTE APPLICABILITY:

The EnSys Petro Test System qualitatively measures the concentration of petroleum hydrocarbons in environmental soil samples.

## STATUS:

In June 2000, the EPA conducted a field demonstration of the EnSys Petro Test System and six other field measurement devices for TPH in soil. The performance and cost of the EnSys Petro Test System were compared to those of an off-site laboratory reference method. A complete description of the demonstration and summary of its results are available in the "Innovative Technology Verification Report: Field Measurement Devices for Total Petroleum Hydrocarbons in Soil-Strategic Diagnostics, Inc., EnSys Petro Test System" (EPA/600/R-01/084).

## DEMONSTRATION RESULTS:

During the demonstration, the EnSys Petro Test System exhibited the following desirable characteristics of a field TPH measurement device: (1) good precision and (2) high sample throughput. In addition, the EnSys Petro Test System exhibited moderate measurement costs. However, a significant number of the EnSys Petro Test System TPH results were determined to be inconclusive because the detection levels used by SDI were not appropriate to address the demonstration objectives. Overall, the device's results did not compare well with those of the reference method; in general, the device exhibited a high positive bias. Collectively, the demonstration findings indicated that the user should exercise caution when considering the device for site-specific field TPH measurement application.

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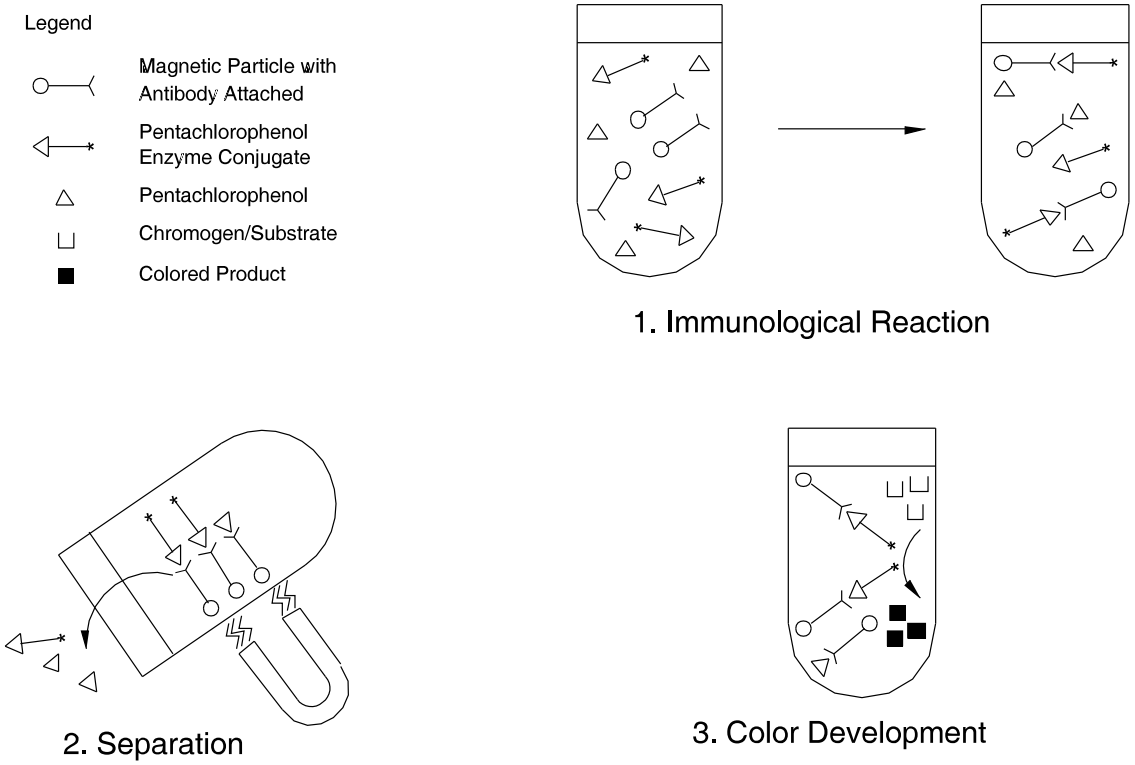
# STRATEGIC DIAGNOSTICS, INC.
## (formerly OHMICRON CORPORATION)
## (RaPID Assay®)

## TECHNOLOGY DESCRIPTION:

The RaPID Assay® kit is designed to quickly provide quantitative results for pentachlorophenol (PCP) concentrations in soil and water samples. The kit uses immunoassay chemistry to produce detectable and quantifiable compound-specific reactions for PCP, as shown in the figure below. Polyclonal antibodies bound to paramagnetic particles are introduced into a test tube where they offer binding sites for PCP. An enzyme conjugate containing a PCP derivative is added to the test tube, where it competes with PCP from samples for antibody binding sites. A magnetic field is applied to each test tube to hold the paramagnetic particles containing PCP and enzyme conjugate, while excess sample and enzyme conjugate are washed from the test tube.

Reagents are then added to the test tube, where they react with the enzyme conjugate and form a color. The color formed in the sample is compared to the color formed by PCP calibration standards. The comparison is made with a spectrophotometer. Samples with PCP concentrations above the calibration range can be diluted and reanalyzed.

The RaPID Assay® kit has several advantages and limitations when used under field conditions. The method is field portable, easy and fast to operate, and inexpensive. The RaPID Assay® kit is limited in that (1) electricity is required to operate the spectrophotometer, (2) the immunoassay method may be affected by temperature fluctuations, and (3) cross-reactivity may occur for compounds similar to PCP.




RaPID Assay®

## WASTE APPLICABILITY:

The RaPID Assay® kit can be used to identify and quantify PCP in soil and water samples. The developer reports the detection limit for soils at 0.1 part per million and water samples at 0.06 part per billion.

## STATUS:

The RaPID Assay® kit was evaluated during a SITE field demonstration in Morrisville, North Carolina in August 1993. A photograph of the kit is shown below. In addition, samples collected from a location in Winona, Missouri were analyzed to evaluate the effects of different matrices and PCP carriers. The Innovative Technology Evaluation Report (EPA/540/R-95/514), which details results from the demonstration, is available from EPA.

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RaPID Assay Used During the SITE Demonstration

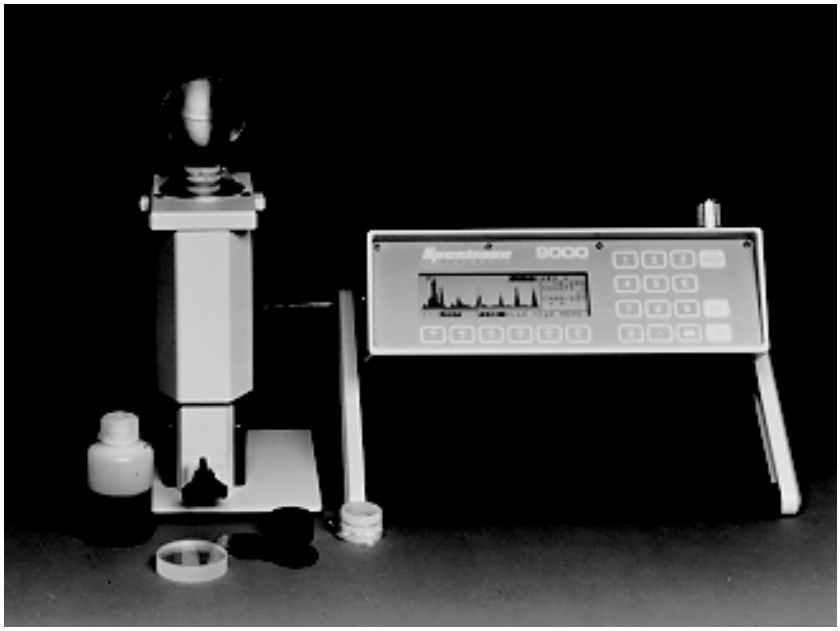
# THERMO NORAN
## (formerly TN Spectrace)
## (TN 9000 and TN Pb X-Ray Fluorescence Analyzers)

## TECHNOLOGY DESCRIPTION:

The TN 9000 X-ray Fluorescence (XRF) Analyzer (see photograph below) is a field portable unit that simultaneously analyzes elements ranging from sulfur to uranium. The TN Pb Analyzer was designed to analyze for lead in soil, paint and paint chips, and other matrices. It can also measure arsenic, chromium, iron, copper, manganese, and zinc in soils. Both instruments are compact, lightweight, and do not require liquid nitrogen. A rechargeable battery allows the XRF analyzers to be used at remote sites where electricity is unavailable.

The TN 9000 Analyzer and the TN Pb Analyzer both use a high-resolution mercuric iodide detector to provide elemental resolution and low detection limits. The TN 9000 Analyzer is equipped with the radioisotope sources iron-55, cadmium-109, and americium-241, which allow for identification and quantification of 26 elements. The TN Pb Analyzer is equipped only with the cadmium-109 source, which allows for the quantification and identification of the seven elements listed above.

The TN 9000 Analyzer and TN Pb Analyzer consist of two main components: a probe and an electronics unit. The probe is connected to the electronics unit by a flexible cable that allows analysis of soil samples in the in situ or intrusive modes. The probe contains the detector and excitation sources and weighs approximately 4 pounds. The electronics unit contains a 2,048-multichannel analyzer for spectral analysis. A maximum of 300 sets of results and 120 spectra can be stored in the TN 9000 before downloading to a personal computer (PC). A maximum of 600 sets of results and 100 spectra can be stored in the TN Pb Analyzer before downloading to a PC. All elemental concentrations are displayed in parts per million on the liquid crystal display (LCD) of the electronic console. The electronics unit weighs approximately 15 pounds and can be carried in the field in a water- repellant carrying case. The electronic unit is battery-powered and can run up to 8 hours on a full charge.



TN 9000 X-Ray Fluorescence Analyzer

Both instruments incorporate user-friendly, menu-driven software to operate the instrument. The TN 9000 Analyzer and TN Pb Analyzer are calibrated using fundamental parameters, which is a standardless calibration technique. At the time of the SITE demonstration, the TN 9000 and TN Pb Analyzers cost $58,000 and $39,500, respectively. These costs included all equipment necessary to operate the instrument. Leasing and rental options are also available. The TN 9000 Analyzer, using all three excitation sources, is capable of analyzing 100 samples per day. The TN Pb Analyzer is capable of analyzing 20 to 25 samples per hour using a 60-second count time for the cadmium-109 source.

## WASTE APPLICABILITY:

The TN 9000 and TN Pb Analyzers can detect select elements in soil, sediment, filter, and wipe samples. The TN Pb Analyzer can also detect lead in paint. Both units can identify select elements at concentrations ranging from parts per million to percentage levels in soil samples obtained from mining and smelting sites, drum recycling facilities, and plating facilities. These instruments can provide real-time, on-site analytical results during field screening and remediation operations. XRF analysis is faster and more cost-effective compared to conventional laboratory analysis.

## STATUS:

The TN 9000 and TN Pb Analyzers were demonstrated under the SITE Program in April 1995. The results were summarized in Technical Report No. EPA/600/R-97/145, dated March 1998. The instruments were used to identify and quantify concentrations of metals in soils. Evaluation of the results yielded field-based method detection limits, accuracy, and precision data from the analysis of standard reference materials and performance evaluation samples.

Comparability of the XRF results to an EPA-approved reference laboratory method was also assessed. The draft fourth update to SW-846 includes Method 6200, dated January 1998, which is based on this demonstration. TN Pb - no longer offered.

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# TRI-SERVICES
## (Site Characterization and Analysis Penetrometer System [SCAPS])

## TECHNOLOGY DESCRIPTION:

The Tri-Services Site Characterization and Analysis Penetrometer System (SCAPS) was developed by the U.S. Army (U.S. Army Corps of Engineers, Waterways Experiment Station [WES] and the Army Environmental Center [AEC]), Navy (Naval Command, Control and Ocean Surveillance Center), and the Air Force (Armstrong Laboratory). The U.S. Army holds a patent for the application of laser sensors combined with cone penetrometry. The laser- induced fluorescence (LIF) system used in the SCAPS was modified from a design developed by the Navy to detect petroleum, oil, and lubricant fluorescence in seawater.

A complete cone penetrometer (CPT) truck system consists of a truck, hydraulic rams andassociated controllers, and the CPT itself (see photograph below). The weight of the truck provides a static reaction force, typically 20 tons, to advance the CPT. The hydraulic system, working against the static reaction force, advances 1-meter-long, 3.57-centimeter-diameter threaded push rod segments into the ground. The CPT, which is mounted on the end of the series of push rods, contains LIF sensors that continuously log tip stress and sleeve friction.

The data from these sensors are used to map subsurface stratigraphy. Conductivity or pore pressure sensors can be driven into the ground simultaneously. The 20-ton truck is designed with protected work spaces.

The SCAPS has been modified to provide automatic grouting of the penetrometer hole during retraction of the CPT. It can also decontaminate the push rods as they are retracted from the soil. The 20-ton CPT system is capable of pushing standard push rods to depths of approximately 50 meters.

The main LIF sensor components are as follows:

- Nitrogen ($N_2$) laser
- Fiber optic cable
- Monochromator to resolve the fluorescence emission as a function of wavelength
- Photodiode array (PDA) to detect the fluorescence emission spectrum and transduce the optical signal into an electrical signal
- optical multichannel analyzer (OMA) to interface between the optic system and the computer system
- Computer system

Site Characterization and Analysis Penetrometer System (SCAPS)

To operate the SCAPS LIF sensor, the CPT is positioned over a designated penetration point. The LIF sensor response is checked using a standard rhodamine solution held against the sapphire window; sensor response is checked before and after each penetration. The CPT is then advanced into the soil.

The SCAPS LIF system is operated with a $N_2$ laser. The PDA accumulates the fluorescence emission response over 10 laser shots, and the PDA retrieves an emission spectrum of the soil fluorescence and returns this information to the OMA and computer system. The LIF sensor and stratigraphy data collection are interpreted by the on-board computer system.

The spectral resolution of the LIF system under these operating conditions is 2 centimeters. The fluorescence intensity at peak emission wavelength for each stored spectrum is displayed along with the soil classification data.

## WASTE APPLICABILITY:

The Tri-Services SCAPS was designed to qualitatively and quantitatively identify classes of petroleum, polynuclear aromatic hydrocarbon, and volatile organic compound contamination in subsurface soil samples.

## STATUS:

The technology field demonstration was held in EPA Region 7 during September 1994. The Innovative Technology Evaluation Report (EPA/540/R-95/520) is available from EPA. Since the SITE demonstration in 1994, the U.S. Army has developed the SCAPS Petroleum Sensor (for detection of fluorescing petroleum, oil and lubricant contaminants in groundwater and soil), SCAPS Explosives Sensor (for detection of nitrogen-based explosive compounds), SCAPS Hybrid VOC Sensor/Sampler (for detection of VOCs in soil), SCAPS Metals Sensor (for in situ detection of meal contaminants in subsurface media), and a SCAPS Radionuclide Sensor (for detection of gamma emitting radionuclides in groundwater, mixed tank wastes, and soil). These technologies have not been demonstrated in the SITE Program.

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# UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
## (Field Analytical Screening Program - PCB Method)

## TECHNOLOGY DESCRIPTION:

The field analytical screening program (FASP) polychlorinated biphenyl (PCB) method uses a temperature-programmable gas chromatograph (GC) equipped with an electron-capture detector (ECD) to identify and quantify PCBs in soil and water. Gas chromatography is an EPA-approved method for determining PCB concentrations. The FASP PCB method is a modified version of EPA SW-846 Method 8080.

In the FASP PCB method for soil samples, PCBs are extracted from the samples, injected into a GC, and identified and quantified with an ECD. Soil samples must be extracted before analysis begins. Hexane and sulfuric acid are used during the extraction process, which removes potential interferences from the soil sample. Chromatograms for each sample are compared to the chromatograms for PCB standards. Peak patterns and retention times from the chromatograms are used to identify and quantify PCBs in the soil sample extract. In addition to the GC, the operator may use an autosampler that automatically injects equal amounts of the sample extract into the GC column. The autosampler ensures that the correct amount of extract is used for each analysis and allows continual analysis without an operator. The FASP PCB method quickly provides results with statistical accuracy and detection limits comparable to those achieved by formal laboratories. The method can also identify individual Aroclors.

Instrumentation and equipment required for the FASP PCB method are not highly portable. When mounted in a mobile laboratory trailer, however, the method can operate on or near most sites relatively easily. Use of this method requires electricity, and Aroclor standards require refrigeration. An exhaust hood and carrier gases also are needed.

## WASTE APPLICABILITY:

The FASP PCB method can identify and quantify PCBs in soil and water samples.

## STATUS:

The FASP PCB method was demonstrated under the SITE Program at a well-characterized, PCB-contaminated site. During the demonstration, the method was used to analyze 112 soil samples, 32 field duplicates, and two performance evaluation samples. Split samples were submitted to an off-site laboratory for confirmatory analysis by SW-846 Method 8080. Data generated by the FASP PCB method were directly compared with the data from the off-site laboratory to evaluate the method's accuracy and precision. In addition, the operational characteristics and performance factors of the FASP PCB method were evaluated.

The stated detection limit for the FASB PCB method is 0.4 parts per million (ppm). During the demonstration, the method achieved a detection limit as low as 0.1 ppm. In addition, up to 21 samples were analyzed by the method in an 8-hour period. The Innovative Technology Evaluation Report (EPA/540/R-95/521) contains additional details on the method’s demonstration and evaluation and is available from EPA.

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# WILKS ENTERPRISE, INC.
## (Infrared Analysis)

## TECHNOLOGY DESCRIPTION:

The Infracal® TOG/TPH Analyzer developed by Wilks is based on infrared analysis. The device can be operated as either Model CVH or Model HATR-T simply by switching sample stages. Model CVH uses a sample stage that contains a quartz cuvette, and Model HATR-T uses the cubic zirconia horizontal attenuated total reflection sample stage. Model CVH is used when a sample contains GRO, extended diesel range organics (EDRO), or both, and Model HATR-T is used when a sample contains only EDRO. Because of the environmental hazards associated with chlorofluorocarbons, Model HATR-T, which uses Vertrel® MCA, is preferred over Model CVH, which uses Freon 113, a chlorofluorocarbon. However, Model CVH is more sensitive and can achieve a lower detection limit than Model HATR-T.

The Infracal® TOG/TPH Analyzer includes a single-beam, fixed-wavelength, nondispersive infrared filter-based spectrophotometer with a dual detector system. In Model CVH, a pulsed beam of infrared radiation from a tungsten lamp is transmitted to a quartz cuvette that contains a sample extract. In Model HATR-T, which is an evaporation technique, an extract is placed directly on the sample stage. The radiation that passes through the sample extract enters the dual detector system, whose filters isolate a reference wavelength (2,500 nanometers) and an analytical wavelength (3,400 nanometers) to measure PHCs present in the extract.

## WASTE APPLICABILITY:

The Infracal® TOG/TPH Analyzer measures total oil and grease or total petroleum hydrocarbon concentration levels in soil or water.


Model HATR-T


MODEL CVH

## STATUS:

Two models of the Infracal® TOG/TPH Analyzer – the Model HATR-T and CVH – were demonstrated in June 2000 at an EPA SITE Study on Field Measurement Technologies for Total Petroleum Hydrocarbons in Soil. Over 200 soil samples were analyzed. Environmental samples were collected in five areas contaminated with gasoline, diesel, lubricating oil and other petroleum products. Performance evaluation samples were prepared by a commercial provider. The performance attributes tested included method detection limits, accuracy and precision, effect of interferents, skill and training required, portability and durability, and cost and time per sample. The performance and cost were compared to an off-site laboratory reference method, (SW-846) Method 8015 B. The Innovative Technology Verification Report (EPA/600/R-X01/088) is available from the EPA.

## DEMONSTRATION RESULTS:

The method detection limit was determined to be 76 mg/kg for the Infracal TOG/TPH Analyzer. Seventy-two of 101 results agreed with those of reference method. There were 2 false positives, and 27 false negatives. Of 105 results used to measure measurement bias, 78 were biased low, and 27 were biased high. For soil environmental samples, the results were statistically the same as the reference method for one out of five sampling areas. The analyzer exhibited less overall precision than the reference method (RSD ranges were 5 to 30 percent and 5.5 to 18 percent for the device and the reference method respectively. The analyzer showed varying mean responses for interferents such as PCE (1 percent), MTBE (62 percent), Stoddard solvent (120 percent), and turpentine (77 percent). Moisture content had a statistically significant impact on TPH results for diesel soil samples, but not for weathered gasoline soil samples. Both the measurement time and cost compared well with those of the reference method.

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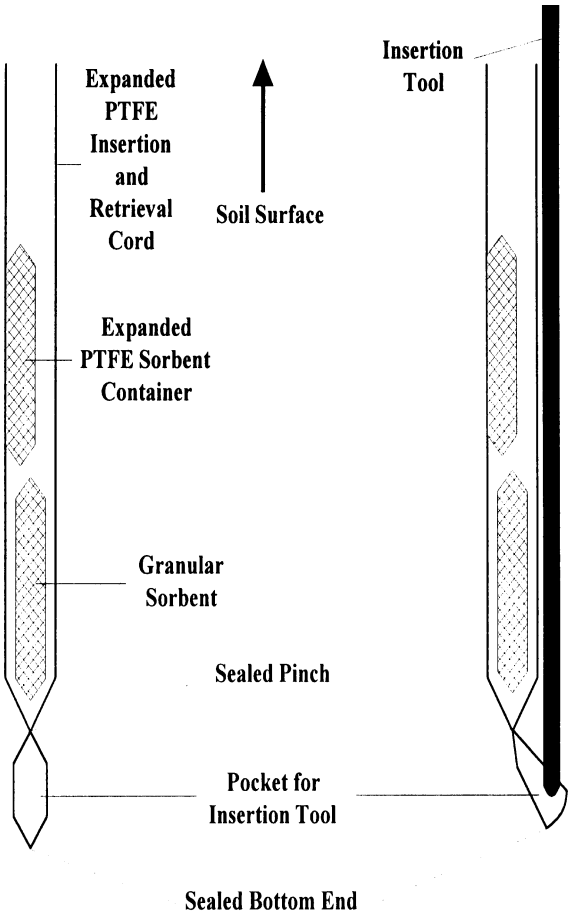
# W.L. GORE AND ASSOCIATES, INC.
## (GORE-SORBER® Screening Survey)

## TECHNOLOGY DESCRIPTION:

The GORE-SORBER® Screening Survey employs the use of patented passive soil vapor sampling devices (GORE-SORBER Modules), which are made of an inert, hydrophobic, microporous expanded polytetrafluoroethylene (ePTFE, similar to Teflon® brand PTFE) membrane. The membrane transfer of soil and liquid, but allows the soil gases to move across the membrane for collection onto engineered sorbents. These sorbents are designed to minimize the affects of water vapor and to detect a broad range of VOCs and SVOCs.

GORE-SORBER® Screening Surveys have been used successfully at thousands of sites for determining subsurface areas impacted by VOCs and SVOCs. Organic compounds commonly detected include halogenated solvents, straight- and branched-chain aliphatics, aromatics, and polycyclic aromatic hydrocarbons (PAH). Many of these compounds are associated with a wide range of petroleum products, including gasoline, mineral spirits, heating oils, creosotes, and coal tars. GORE-SORBER® Screening Surveys have also been used successfully to screen fornitroaromatic explosives, chemical warfare agents, precursors, breakdown products, and pesticides.




GORE-SORBER®

The GORE-SORBER® Screening Survey is a service that includes the manufacturing of the samplers, the analysis of the samplers (through thermal desorption, gas chromatography, and mass selective detection), and a final report that includes color contour plots of the compounds detected.

## WASTE APPLICABILITY:

Common applications of the GORE-SORBER® Screening Surveys include detection of compounds to (1) trace soil and groundwater plumes in porous and fractured media, (2) monitor progress of subsurface in situ remedial actions, (3) provide baseline data for real estate transfer assessments, and (4) reduce groundwater monitoring costs. Prudent use of this technology can optimize and reduce soil and groundwater sampling efforts, resulting in significant cost savings over the life of site assessment and remedial action programs.

The GORE-SORBER® Screening Survey was accepted into the SITE Demonstration Program in November 1996. The SITE field demonstration was completed in May 1997. Since this technology has been accepted into the SITE program, water quality monitoring and the design of the GORE-SORBER Module have been improved.

The SITE demonstration showed that the GORE-SORBER® Screening Survey is more sensitive than active soil gas sampling, and therefore more accurate in terms of detecting and reporting low concentrations of some compounds. The technology demonstration also revealed that this survey is more accurate when the soil conditions would otherwise restrict the use of active soil gas methods, for example, where the soil is very dense or nearly saturated. Additionally, this sorbent based method provides a more robust system for sample collection and analysis for those projects that have more stringent data quality objectives.

Demonstration results are documented in the "Environmental Technology Verification" report for the sampler dated August 1998 (EPA/600/R-98/095).

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# XONTECH INCORPORATED
## (XonTech Sector Sampler)

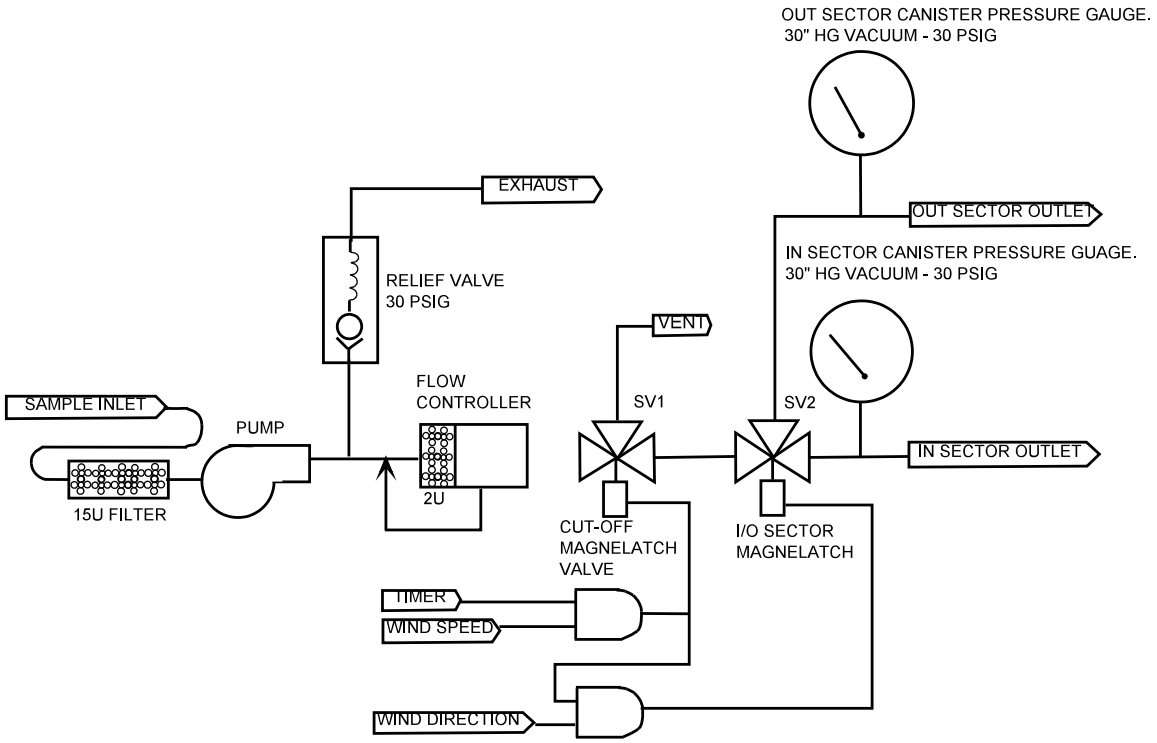
## TECHNOLOGY DESCRIPTION:

The XonTech Incorporated (XonTech) sector sampler collects time-integrated whole air samples in Summa™-polished canisters (see diagram below). The wind sensor directs whole air, sampled at a constant rate, into either an "in" sector canister or an "out" sector canister. When wind velocity exceeds 0.37 meter per second (m/s) from the direction of the suspected emissions area (the target), the first canister is filled. When the wind velocity exceeds 0.37 m/s from any other direction, the other canister is filled. When the wind velocity falls below 0.37 m/s, either canister or neither canister may receive the sample. Over an extended period of time, a target sample and a background sample are collected. This method is analogous to upwind-downwind sampling but does not require two distinct sites or manual sampler control.

The sampler is portable and can be battery- or AC-powered. The air samples are analyzed by gas chromatograph (EPA Method TO-14) for volatile organic compounds (VOC). The use of sector samplers enables identification of VOCs originating from the source and differentiation between other sources in the vicinity.

## WASTE APPLICABILITY:

The XonTech sector sampler can monitor VOC emissions from hazardous waste sites and other emission sources before and during remediation. Short-term sampling can determine which high concentration compounds are emitted from a site. Long-term monitoring can assess an emission source's potential effects on the local population, providing data to support risk analyses.



Schematic Diagram of the XonTech Sector Sampler

## STATUS:

The XonTech sector sampler's usability has been demonstrated in two short-term field studies. This technology has been applied to industrial emissions as well as emissions from landfill sites. Mathematical methods for processing data have been developed and shown to be appropriate.

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## APPLICABILITY INDEX

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
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| | | Materials Handling | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical | ARS Technologies Inc. | Pneumatic Fracturing Extraction and Catalytic Oxidation | 1 |
| | | | ENERGIA, Inc. | Reductive Thermal and Photo-Thermal Oxidation for Enhanced Conversion of Chlorocarbons | 2 |
| | | | KSE, Inc. | Adsorption-Integrated-Reaction Process | 2 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Aqueous Phase Organic Destruction | 1/2 |
| | | | Matrix Photocatalytic Inc | Photocatalytic Air Treatment | 1/2 |
| | | | Membrane Technology and Research, Inc. | VaporSep® Membrane Process | 2 |
| | | | Xerox Corporation | 2-PHASE™ EXTRACTION Process | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | HNU Systems, Inc. | HNU GC 311D Portable Gas Chromatograph | 3 |
| | | | Microsensor Systems, Inc. | MSI-301A Vapor Monitor | 3 |
| | | | Hewlett-Packard Company | Portable Gas Analyzer | 3 |
| | | | Photovac Monitoring Instruments | PE Photovac Voyager Portable Gas Chromatograph | 3 |
| | | | Sentex Systems Inc. | Scentograph Plus II Portable Gas Chromatograph | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| Air (Cont.) | Aromatic VOCs (Cont.) | Spectrometers | Graseby Ionics, Ltd. and PCP Inc. | Ion Mobility Spectrometry | 3 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | XonTech, Inc. | XonTech Sector Sampler | 3 |
| | | Thermal Destruction | Sonotech, Inc. | Frequency-Tunable Pulse Combustion System | 1 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | Dioxins | Materials Handling | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical Treatment | Matrix Photocatalytic Inc. | Photocatalytic Aqueous Phase Organic Destruction | 1/2 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Air Treatment | 1/2 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | Spectrometers | Graseby Ionics Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Thermal Destruction | Energy and Environmental Research Corp. | Reactor Filter System | 2 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | Furans | Materials Handling | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical Treatment | Matrix Photocatalytic Inc. | Photocatalytic Aqueous Phase Organic Destruction | 1/2 |
| | | | Matrix Photocatalytic, Inc. | Photocatalytic Air Treatment | 1/2 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Thermal Destruction | Energy and Environmental Research Corp. | Reactor Filter System | 2 |
| Air (Cont.) | Furans (Cont.) | Thermal Destruction | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | Halogenated VOCs | Biological Degradation | Remediation Technologies, Inc. | Biofilm Reactor for Chlorinated Gas Treatment | 2 |
| | | Materials Handling | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical Thermal Desorption | Process/Technologies, Inc. | Photolytic Destruction of Vapor-Phase Halogens | 1 |
| | | Physical/Chemical Treatment | ARS Technologies Inc. | Pneumatic Fracturing Extraction™ and Catalytic Oxidation | 1 |
| | | | Arizona State U./ Zentox Corp. | Photocatalytic Oxidation with Air Stripping | 2 |
| | | | ENERGIA, Inc. | Reductive Photo-Dechlorination Treatment | 2 |
| | | | ENERGIA, Inc. | Reductive Thermal and Photo-Thermal Oxidation Processes for Enhanced Conversion of Chlorocarbons | 2 |
| | | | KSE, Inc. | Adsorption-Integrated-Reaction Process | 2 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Aqueous Phase Organic Destruction | 1/2 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Air Treatment | 1/2 |
| | | | Membrane Technology and Research, Inc. | VaporSep® membrane Process | 2 |
| | | | Thermatrix Inc. | Photolytic Oxidation Process | 2 |
| | | | Roy F. Weston, Inc. | Ambersorb® 563 Adsorbent | 2 |
| | | | Xerox Corp. | 2-PHASE™ EXTRACTION Process | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | Photovac Monitoring Instruments | PE Photovac Voyager Portable Gas Chromatograph | 3 |
| Air (Cont.) | Halogenated VOCs (Cont.) | Portable Gas Chromatographs | Sentex Systems Inc. | Scentograph Plus II Portable Gas Chromatograph | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | | XonTech, Inc. | XonTech Sector Sampler | 3 |
| | | Thermal Destruction | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | Herbicides | Materials Handling | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical Treatment | Matrix Photocatalytic Inc. | Photocatalytic Aqueous Phase Organic Destruction | 1/2 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Thermal Destruction | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | Metals | Materials Handling | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical Treatment | General Atomics, Nuclear Remediation Technologies Division | Acoustic Barrier Particulate Separator | 2 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Aqueous Phase Organic Destruction | 1/2 |
| | | Portable Gas Chromatographs | HNU Systems, Inc. | HNU GC 311D Portable Gas Chromatograph | 3 |
| | | | Microsensor Systems, Inc. | MSI-301A Vapor Monitor | 3 |
| | | | Hewlett-Packard Company | Portable Gas Analyzer | 3 |
| | | Thermal Destruction | American Combustion, Inc. | PYRETRON® Thermal Destruction | 1 |
| Air (Cont.) | Metals (Cont.) | Thermal Destruction (Cont.) | Energy and Environmental Research Corp. | Reactor Filter Systems | 2 |
| | PAHs | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | PCBs | Materials Handling | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical Treatment | Matrix Photocatalytic Inc. | Photocatalytic Aqueous Phase Organic Destruction | 1/2 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | HNU Systems, Inc. | HNU GC 311D Portable Gas Chromatograph | 3 |
| | | | Microsensor Systems, Inc. | MSI-301A Vapor Monitor | 3 |
| | | | Hewlett-Packard Company | Portable Gas Analyzer | 3 |
| | | | Sentex Systems Inc. | Scentograph Plus II Portable Gas Chromatograph | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP Inc. | Ion Mobility Spectrometry | 3 |
| | | Thermal Destruction | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | Pesticides | Materials Handling | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical Treatment | Matrix Photocatalytic Inc. | Photocatalytic Aqueous Phase Organic Destruction | 1/2 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | Sentex Systems Inc. | Scentograph Plus II Portable Gas Chromatograph | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| Air (Cont.) | Pesticides (Cont.) | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Thermal Destruction | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | Petroleum Hydrocarbons | Portable Gas Chromatographs | SRI Instruments | Compact Gas Chromatographs | 3 |
| | SVOCs | Materials Handling | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Physical/Chemical Thermal Desorption | Process Technologies, Inc. | Photolytic Destruction of Vapor-Phase Halogens | 1 |
| | | Physical/Chemical Treatment | ARS Technologies Inc. | Pneumatic Fracturing Extraction™ and Catalytic Oxidation | 1 |
| | | | ENERGIA, Inc. | Reductive Thermal and Photo-Thermal Oxidation Processes for Enhanced Conversion of Chlorocarbons | 2 |
| | | | Xerox Corp. | 2-PHASE™ EXTRACTION Process | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | | XonTech, Inc. | XonTech Sector Sampler | 3 |
| | | Thermal Destruction | Sonotech, Inc. | Frequency-Turnable Pulse Combustion System | 1 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | VOCs | Biological Degradation | Media & Process Technologies Inc. | Bioscrubber | 2 |
| | | Materials Handling | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical Thermal Desorption | Process Technologies, Inc. | Photolytic Destruction of Vapor-Phase Halogens | 1 |
| | | Physical/Chemical Treatment | ARS Technologies, Inc. | Pneumatic Fracturing Extraction™ and Catalytic Oxidation | 1 |
| Air (Cont.) | VOCs (Cont.) | Physical/Chemical Treatment (Cont.) | Arizona State U./ Zentox Corp. | Photocatalytic Oxidation with Air Stripping | 2 |
| | | | ENERGIA, Inc. | Reductive Photo-Dechlorination Treatment | 2 |
| | | | ENERGIA, Inc. | Reductive Thermal and Photo-Thermal Oxidation Processes for Enhanced Conversion of Chlorocarbon | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | KSE, Inc. | Adsorption-Integrated-Reaction Process | 1 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Aqueous Phase Organic Destruction | 1/2 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Air Treatment | 1/2 |
| | | | Membrane Technology and Research, Inc. | VaporSep® Membrane Process | 2 |
| | | | Thermatrix, Inc. | Photolytic Oxidation Process | 2 |
| | | | Roy F. Weston, Inc. | Ambersorb® 563 Adsorbent | 2 |
| | | | Xerox Corp. | 2-PHASE™ EXTRACTION Process | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | HNU Systems, Inc. | HNU GC 311D Portable Gas Chromatograph | 3 |
| | | | Microsensor Systems, Inc. | MSI-301A Vapor Monitor | 3 |
| | | | Hewlett-Packard Company | Portable Gas Analyzer | 3 |
| | | | Photovac Monitoring Instruments | PE Photovac Voyager Portable Gas Chromatograph | 3 |
| | | | Sentex Systems, Inc. | Scentograph Plus II Portable Gas Chromatograph | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| Air (Cont.) | VOCs | Spectrometers | Environmental Technologies Group, Inc. | AirSentry Fourier Transform Infrared Spectrometer | 3 |
| | | | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | | XonTech, Inc. | XonTech Sector Sampler | 3 |
| | | Thermal Destruction | Sonotech, Inc. | Frequency-Turnable Pulse Combustion System | 1 |
| Gas | Aromatic VOCs | Biological Degradation | Media & Process Technology | Bioscrubber | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Remediation Technologies, Inc. | Biofilm Reactor for Chlorinated Gas Treatment | 2 |
| | | Materials Handling | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical Treatment | ARS Technologies, Inc. | Pneumatic Fracturing Extraction™ and Catalytic Oxidation | 1 |
| | | | ENERGIA, Inc. | Reductive Thermal and Photo-Thermal Oxidation Processes for Enhanced Conversion of Chlorocarbons | 2 |
| | | | KSE, Inc. | Adsorption-Integrated-Reaction process | 2 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Aqueous Phase Organic Destruction | 1/2 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Air Treatment | 1/2 |
| | | | Membrane Technology and Research, Inc. | VaporSep® Membrane Process | 2 |
| | | | Xerox Corp. | 2-PHASE™ EXTRACTION Process | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | HNU Systems, Inc. | HNU GC 311D Portable Gas Chromatograph | 3 |
| | | | Microsensor Systems, Inc. | MSI-301A Vapor Monitor | 3 |
| Gas (Cont.) | Aromatic VOCs (Cont.) | Portable Gas Chromatographs (Cont.) | Hewlett-Packard Company | Portable Gas Analyzer | 3 |
| | | | Photovac Monitoring Instruments | PE Photovac Voyager Portable Gas Chromatograph | 3 |
| | | | Sentex Sensing Technology, Inc. | Scentograph Plus II Portable Gas Chromatograph | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | Spectrometers | Graseby Ionics, Ltd. | Ion Mobility Spectrometry | 3 |
| | | | XonTech, Inc. | XonTech Sector Sampler | 3 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Thermal Destruction | Sonotech, Inc. | Frequency-Turnable Pulse Combustion System | 1 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | Dioxins | Materials Handling | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical Treatment | Matrix Photocatalytic Inc. | Photocatalytic Aqueous Phase Organic Destruction | 1/2 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Air Treatment | 1/2 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Thermal Destruction | Energy and Environmental Research Corp. | Reactor Filter System | 2 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | Furans | Materials Handling | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical Treatment | Matrix Photocatalytic Inc. | Photocatalytic Aqueous Phase Organic Destruction | 1/2 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Air Treatment | 1/2 |
| Gas (Cont.) | Furans (Cont.) | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Thermal Destruction | Energy and Environmental Research Corp. | Reactor Filter System | 2 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | Halogenated VOCs | Biological Degradation | Remediation Technologies, Inc. | Biofilm Reactor for Chlorinated Gas Treatment | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Materials Handling | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical Thermal Desorption | Process Technologies, Inc. | Photolytic Destruction of Vapor-Phase Halogens | 1 |
| | | Physical/Chemical Treatment | ARS Technologies, Inc. | Pneumatic Fracturing Extraction™ and Catalytic Oxidation | 1 |
| | | | Arizona State U./ Zentox Corp. | Photocatalytic Oxidation with Air Stripping | 2 |
| | | | ENERGIA, Inc. | Reductive Photo-Dechlorination Treatment | 2 |
| | | | ENERGIA, Inc. | Reductive Thermal and Photo-Thermal Oxidation process for Enhanced Conversion of Chlorocarbons | 2 |
| | | | KSE, Inc. | Adsorption-Integrated-Reaction Process | 2 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Aqueous Phase Organic Destruction | 1/2 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Air Treatment | 1/2 |
| | | | Membrane Technology and Research, Inc. | VaporSep® Membrane Process | 2 |
| | | | Thermatrix, Inc. | Photolytic Oxidation Process | 2 |
| Gas (Cont.) | Halogenated VOCs (Cont.) | Physical/Chemical Treatment (Cont.) | Roy F. Weston, Inc. | Ambersorb® 563 Adsorbent | 2 |
| | | | Xerox Corp. | 2-PHASE™ EXTRACTION Process | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | Photovac Monitoring Instruments | PE Photovac Voyager Portable Gas Chromatograph | 3 |
| | | | Sentex Systems, Inc. | Scentograph Plus II Portable Gas Chromatograph | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | XonTech, Inc. | XonTech Sector Sampler | 3 |
| | | Thermal Destruction | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | Heavy Metals | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | Herbicides | Materials Handling | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical Treatment | Matrix Photocatalytic Inc. | Photocatalytic Aqueous Phase Organic Destruction | 1/2 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Thermal Destruction | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | Metals | Materials Handling | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical Treatment | General Atomics, Nuclear Remediation Technologies Div. | Acoustic Barrier Particulate Separator | 2 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Aqueous Phase Organic Destruction | 1/2 |
| Gas (Cont.) | Metals (Cont.) | Portable Gas Chromatographs | HNU Systems, Inc. | HNU GC 311D Portable Gas Chromatograph | 3 |
| | | | Microsensor Systems, Inc. | MSI-301A Vapor Monitor | 3 |
| | | | Hewlett-Packard Company | Portable Gas Analyzer | 3 |
| | | Thermal Destruction | American Combustion, Inc. | PYRETRON® Thermal Destruction | 1 |
| | | | Energy and Environmental Research Corp. | Reactor Filter System | 2 |
| | PAHs | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | PCBs | Materials Handling | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical Treatment | Matrix Photocatalytic, Inc. | Photocatalytic Aqueous Phase Organic Destruction | 1/2 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | HNU Systems, Inc. | HNU GC 311D Portable Gas Chromatograph | 3 |
| | | | Microsensor Systems, Inc. | MSI-301A Vapor Monitor | 3 |
| | | | Hewlett-Packard Company | Portable Gas Analyzer | 3 |
| | | | Sentex Systems, Inc. | Scentograph Plus II Portable Gas Chromatograph | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Thermal Destruction | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | Pesticides | Material Handling | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| Gas (Cont.) | Pesticides (Cont.) | Physical/Chemical Treatment | Matrix Photocatalytic, Inc. | Photocatalytic Aqueous Phase Organic Destruction | 1/2 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | Sentex Systems, Inc. | Scentograph Plus II Portable Gas Chromatograph | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Thermal Destruction | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | Petroleum Hydrocarbons | Portable Gas Chromatograph | SRI Instruments | Compact Gas Chromatograph | 3 |
| | SVOCs | Material Handling | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Physical/Chemical Thermal Desorption | Process Technologies, Inc. | Photolytic Destruction of Vapor-Phase Halogens | 1 |
| | | Physical/Chemical Treatment | ARS Technologies, Inc. | Pneumatic Fracturing Extraction™ and Catalytic Oxidation | 2 |
| | | | ENERGIA, Inc. | Reductive Thermal and Photo-Thermal Oxidation Processes for Enhanced Conversion of Chlorocarbons | 2 |
| | | | Xerox Corp. | 2-PHASE™ EXTRACTION Process | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | | XonTech, Inc. | XonTech Sector Sampler | 3 |
| | | Thermal Destruction | Sonotech, Inc. | Frequency-Turnable Pulse Combustion System | 1 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| Gas (Cont.) | VOCs | Biological Degradation | Media & Process Technology | Bioscrubber | 2 |
| | | Materials Handling | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical Thermal Desorption | Process Technologies, Inc. | Photolytic Destruction of Vapor-Phase Halogens | 1 |
| | | Physical/Chemical Treatment | ARS Technologies, inc. | Pneumatic Fracturing Extraction™ and Catalytic Oxidation | 1 |
| | | | Arizona State U/ Zentox Corp. | Photocatalytic Oxidation with Air Stripping | 2 |
| | | | AWD Technologies, Inc. | Aqua Detox®/SVE System | 1 |
| | | | ENERGIA, Inc. | Reductive Photo-Dechlorination Treatment | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | ENERGIA, Inc. | Reductive Thermal and Photo-Thermal Oxidation Processes for Enhanced Conversion of Chlorocarbons | 2 |
| | | | KSE, Inc. | Adsorption-Integrated-Reaction Process | 2 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Aqueous Phase Organic Destruction | 1/2 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Air Treatment | 1/2 |
| | | | Membrane Technology and Research, Inc. | VaporSep® Membrane Process | 2 |
| | | | Thermatrix, Inc. | Photolytic Oxidation Process | 2 |
| | | | Roy F. Weston, Inc. | Ambersorb® 563 Adsorbent | 2 |
| | | | Xerox Corp. | 2-PHASE™ EXTRACTION Process | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | HNU Systems, Inc., | HNU GC 311D Portable Gas Chromatograph | 3 |
| Gas (Cont.) | VOCs (Cont.) | Portable Gas Chromatographs (Cont.) | Microsensor Systems, Inc. | MSI-301A Vapor Monitor | 3 |
| | | | Hewlett-Packard Company | Portable Gas Analyzer | 3 |
| | | | Photovac Monitoring Instruments | PE Photovac Voyager Portable Gas Chromatograph | 3 |
| | | | Sentex Systems, Inc. | Scentograph Plus II Portable Gas Chromatograph | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | Spectrometers | Environmental Technologies Group, Inc. | AirSentry Fourier Transform Infrared Spectrometer | 3 |
| | | | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | | XonTech, Inc. | XonTech Sector Sampler | 3 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Thermal Destruction | Sonotech, Inc. | Frequency-Turnable Pulse Combustion System | 1 |
| Ground water | Aromatic VOCs | Biological Degradation | Billings and Associates, inc. | Subsurface Volatilization and Ventilation Systems (SVVS®) | 1 |
| | | | Bio-Rem, Inc. | Augmented in Situ Subsurface Bioremediation Process | 1 |
| | | | BioTrol, Inc. | Biological Aqueous Treatment System | 1 |
| | | | Electrokinetics, Inc. | In Situ Bioremediation by Electrokinetic Injection | 2 |
| | | | New York State Department of Environmental Conservation/R.E. Wright Environmental Inc. | In Situ Bioventing Treatment System | 1 |
| | | | Harding ESE, a MacTech Co. | Two-Zone, Plume Interception, Inc Situ Treatment Technology | 1/2 |
| | | | IT Corporation | Oxygen Microbubbles In Situ Bioremediation | 2 |
| Ground water (Cont.) | Aromatic VOCs (Cont.) | Biological Degradation (Cont.) | ZENON Environmental Inc. | ZenoGem™ Process | 1 |
| | | Materials Handling | National Risk Management Research Laboratory, U. of Cincinnati, and FRX, Inc. | Hydraulic Fracturing | 1 |
| | | Physical/Chemical Thermal Desorption | Hughes Environmental Systems, Inc. | Steam Enhanced Recovery Process | 1 |
| | | | NOVATERRA, Associates | In Situ Soil Treatments (Steam/Air Stripping) | 1 |
| | | | Rochem Separation Systems, Inc. | Rochem Disc Tube™ Module System | 1 |
| | | | SoilTech ATP Systems, Inc. | Anaerobic Thermal Processor | 1 |
| | | | Western Research Institute | Contained Recovery of Oily Wastes (CROW™) | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Physical/Chemical Treatment | ARS Technologies, Inc. | Pneumatic Fracturing Extraction™ and Catalytic Oxidation | 1 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 2 |
| | | | Terra Therm Inc. age Environmental Applications, Inc. | High Energy Electron Beam Irradiation | 1/2 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Irradiation | 1/2 |
| | | | KSE, Inc. | Adsorption-Integrated-Reaction Process | 2 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Aqueous Phase Organic Destruction | 1/2 |
| | | | Thermatrix, Inc. | X-ray Treatment of Aqueous Solutions | 2 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| Ground water (Cont) | Aromatic VOCs (Cont) | Physical/Chemical Treatment (Cont) | Terra Vac, Inc. | In Situ and Ex Situ Vacuum Extraction | 1 |
| | | | U. of Nebraska - Lincoln | Center Pivot Spray Irrigation System | 1 |
| | | | Roy F. Weston, Inc./IEG Technologies | UVB - Vacuum Vaporizing Well | 1 |
| | | | Xerox Corp. | 2-PHASE™ EXTRACTION Process | 1 |
| | | | ZENON Environmental Inc. | Cross-Flow Pervaporation System | 1 |
| | | Portable Gas Chromatographs | Analytical and Remedial Technology, Inc. | Automated Sampling and Analytical Platform | 3 |
| | | | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | HNU Systems, Inc. | HNU GC 311D Portable Gas Chromatograph | 3 |
| | | | Hewlett-Packard Company | Portable Gas Analyzer | 3 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| Ground water (Cont) | | | Photovac Monitoring Instruments | PE Photovac Voyager Portable Gas Chromatograph | 3 |
| | | | Sentex Systems, Inc. | Scentograph Plus II Portable Gas Chromatograph | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | | U.S. EPA | Field Analytical Screening Program PCB Method | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Hanby Environmental Laboratory Procedure, Inc. | Test Kits for Organic Contaminants in Soil and Water | 3 |
| | | Thermal Destruction | Texaco Inc. | Texaco Gasification Process | 1 |
| | Aromatic VOCs (Cont) | Thermal Destruction (Cont) | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | Cyanide | Biological Degradation | Pintail Systems, Inc. | Spent Ore Bioremediation Process | 1/2 |
| | | Physical/Chemical Treatment | E & C Williams, Inc. | Calsium Sulfide and Calcium Polysulfide Technologies | 3 |
| | Diesel | Materials Handling | National Risk Management Research Laboratory, U. of Cincinnati, and FRX, Inc. | Hydraulic Fracturing | 1 |
| | | Physical/Chemical Thermal Desorption | Integrated Water Resources, Inc. | Dynamic Underground Stripping of TCE | 1 |
| | | | Steam Tech Environmental Services | Steam Enhanced Remediation | 1 |
| | | Spectrometers | SiteLAB Corporation | Ultraviolet Fluorescence Spectroscopy | 3 |
| | Dioxins | Physical/Chemical Thermal Desorption | ELI Eco Logic International Inc. | GAS-Phase Chemical Reduction Process | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Integrated Water Resources | Dynamic Underground Stripping of TCE | 1 |
| | | | SoilTech ATP Systems, Inc. | Anaerobic Thermal Processor | 1 |
| | | | SteamTech Environmental Services | Steam Enhanced Remediation | 1 |
| | | Physical/Chemical Treatment | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | High Voltage Environmental Applications, Inc. | High-Energy Electron Irradiation | 1/2 |
| | | | IT Corporation | KMnO4 Oxidation of TCE | 1 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Aqueous Phase Organic Destruction | 1/2 |
| Ground water (Cont) | Dioxins | Physical/Chemical Treatment (Cont) | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Strategic Diagnostics Inc. | RaPID Assay® | 3 |
| | | Thermal Destruction | BWX Technologies Inc. | Cyclone Furnace | 1/2 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | Explosives | Physical/Chemical Thermal Desorption | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | Physical/Chemical Treatment | U.S. Filter/Zimpro Inc. | Ultraviolet Radiation and Oxidation | 1 |
| | Furans | Physical/Chemical Thermal Desorption | ELI Eco Logic International Inc. | Gas-Phase Chemical Reduction Process | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | SoilTech ATP Systems, Inc. | Anaerobic Thermal Processor | 1 |
| | | Physical/Chemical Treatment | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | High Voltage Environmental Applications, Inc. | High-Energy Electron Irradiation | 1/2 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Aqueous Phase Organic Destruction | 1/2 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 3 |
| Ground water (Cont) | Furans (Cont) | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Strategic Diagnostics, Inc. | RaPID Assay® | 3 |
| | | Thermal Destruction | BWX Technologies Inc. | Cyclone Furnace | 1/2 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | Gasoline | Materials Handling | Integrated Water Resources Inc. | Dynamic Underground Stripping of TCE | 1 |
| | | | National Risk Management Research Laboratory, U. of Cincinnati, and FRX, Inc. | Hydraulic Fracturing | 1 |
| | | | SteamTech Environmental Services | Steam Enhanced Remediation | 1 |
| | | Spectrometers | SiteLAB Corporation | Ultraviolet Fluorescence Spectroscopy | 3 |
| | Halogenated VOCs | Biological Degradation | ASC/EMR Wright-Patterson AFB | Phytoremediation of TCE-Contaminated Shallow Groundwater | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Bio-Rem, Inc. | Augmented in Situ Subsurface Bioremediation Process | 1 |
| | | | BioTrol, Inc. | Methanotrophic Bioreactor System | 1 |
| | | | Electrokinetics, Inc. | In Situ Bioremediation by Electrokinetic Injection | 2 |
| | | | Harding ESE, a MacTech Co. | Two-Zone, Plume Interception, In Situ Treatment Technology | 1/2 |
| | | | New York State Department of Environmental Conservation/Science Applications International Corp. | In Situ Bioventing Treatment System | 1 |
| | | | ZENON Environmental Inc. | ZenoGem™ Process | 1 |
| Ground water (Cont) | Halogenated VOCs (Cont) | Materials Handling | National Risk Management Research Laboratory, U. of Cincinnati, and FRX, Inc. | Hydraulic Fracturing | 1 |
| | | Physical Chemical Treatment - Biological Degradation | Pharmacia Corporation | Lasagna™ In Situ Soil Remediation | 1/2 |
| | | Physical/Chemical Thermal Desorption | Hughes Environmental Systems, Inc. | Steam Enhanced Recovery Process | 1 |
| | | | KAI Technologies, Inc./Brown and Root Environmental | Radio Frequency Heating | 1 |
| | | | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | | NOVATERRA Associates | In Situ Soil Treatments (Steam/Air Stripping) | 1 |
| | | | SoilTech ATP Systems, Inc. | Anaerobic Thermal Processor | 1 |
| | | | Western Research Institute | Contained Recovery of Oily Wastes (CROW™) | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Physical/Chemical Treatment | ARS Technologies, Inc. | Pneumatic Fracturing Extraction™ and Catalytic Oxidation | 1 |
| | | | Arizona State U./ Zentox Corp. | Photocatalytic Oxidation with Air Stripping | 2 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | EnviroMetal Technologies, Inc. | In Situ and Ex Situ Metal Enhanced Abiotic Degradation of Dissolved Halogenated Organic Compounds in Groundwater | 1 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Beam Irradiation | 1/2 |
| | | | KSE, Inc. | Adsorption-Integrated-Reaction Process | 2 |
| Ground Water (Cont) | Halogenated VOCs (Cont) | Physical/Chemical Treatment | Matrix Photocatalytic Inc. | Photocatalytic Aqueous Phase Organic Destruction | 1/2 |
| | | | Pulse Sciences, Inc. | X-ray Treatment of Aqueous Solutions | 2 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | | Terra Vac, Inc. | In Situ and Ex Situ Vacuum Extraction | 1 |
| | | | U.S. Filter/Zimpro Inc. | Ultraviolet Radiation and Oxidation | 1 |
| | | | U. of Nebraska - Lincoln | Center Pivot Spray Irrigation System | 4 |
| | | | UV Technologies, Inc. | PhotoCAT™ Process | 2 |
| | | | Roy F. Weston, Inc. | Ambersorb® 563 Adsorbent | 2 |
| | | | Roy F. Weston, Inc./IEG Technologies | UVB - Vacuum Vaporizing Well | 1 |
| | | | Xerox Corp. | 2-PHASE™ EXTRACTION Process | 1 |
| | | | ZENON Environmental Inc. | Cross-Flow Pervaporation System | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Portable Gas Chromatographs | Analytical and Remedial Technology, Inc. | Automated Sampling and Analytical Platform | 3 |
| | | | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | Photovac Monitoring Instruments | PE Photovac Voyager Portable Gas Chromatograph | 3 |
| | | | Sentex Systems, Inc. | Scentograph Plus II Portable Gas Chromatograph | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | | U.S. EPA | Field Analytical Screening Program PCB Method | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |
| Ground water (Cont) | Halogenated VOCs (Cont) | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Strategic Diagnostics, Inc. | RaPID Assay® | 3 |
| | | Thermal Destruction | Texaco Inc. | Texaco Gasification Process | 1 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | Heavy Metals | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | Thermal Destruction | Terra Therm, Inc. | In-Situ Thermal Destruction | 1 |
| | Herbicides | Biological Degradation | BioTrol, Inc. | Biological Aqueous Treatment System | 1 |
| | | | Electrokinetics, Inc. | In Situ Bioremediation by Electrokinetic Injection | 1/2 |
| | | | Phytokinetics, Inc. | Phytoremediation of Contaminated Soils | 2 |
| | | | ZENON Environmental Inc. | ZenoGem™ Process | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Physical Chemical Treatment - Biological Degradation | Pharmacia Corporation | Lasagna™ in Situ Soil Remediation | 1/2 |
| | | Physical/Chemical Thermal Desorption | ELI Eco Logic International Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | | SoilTech ATP Systems, Inc. | Anaerobic Thermal Processor | 1 |
| | | Physical/Chemical Treatment | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Irradiation | 1 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Aqueous Phase Organic Destruction | 1/2 |
| Ground water (Cont) | Herbicides (Cont) | Physical/Chemical Treatment (Cont) | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Strategic Diagnostics Inc. | RaPID Assay® | 1 |
| | | Thermal Destruction | BWX Technologies Inc. | Cyclone Furnace | 1/2 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | Metals | Biological Degradation | Colorado Dept. of Public Health and Environment | Wetlands-Based Treatment | 2 |
| | | | Pintail Systems, Inc. | Biomineralization of Metals | 1/2 |
| | | | Pintail Systems, Inc. | Spent Ore Bioremediation Process | 1/2 |
| | | | Resource Management & Recovery | AlgaSORB© Biological Sorption | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Field Portable X-ray Fluorescence | Metorex, Inc. | Field Portable X-ray Fluorescence Analysis | 3 |
| | | Physical Chemical Treatment - Biological Degradation | Pharmacia Corporation | Lasagna™ In Situ Soil Remediation | 1/2 |
| | | Physical/Chemical Radioactive Waste Treatment | Filter Flow Technology, Inc. | Colloid Polishing Filter Method® | 1 |
| | | Physical/Chemical Thermal Desorption | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | | Rochem Separation Systems, Inc. | Rochem Disc Tube™ Module System | 1 |
| Ground water (Cont) | Metals | Physical/Chemical Treatment | Atomic Energy of Canada, Ltd. | Chemical Treatment and Ultrafiltration | 2 |
| | | | E.I. DuPont de Nemours and Co. and Oberlin Filter Co. | Membrane Microfiltration | 1 |
| | | | Dynaphore, Inc. | FORAGER® Sponge | 1 |
| | | | EPOC Water, Inc. | Precipitation, Microfiltration, and Sludge Dewatering | 1 |
| | | | E & C Williams, Inc. | Calsium Sulfide and Calcium Polysulfide Technologies | 3 |
| | | | General Environmental Corp. | CURE® Electrocoagulation Wastewater Treatment System | 1 |
| | | | Geokinetics International, Inc. | Electrokinetics For NSFO Mobilization | 1 |
| | | | Geokinetics, International, Inc. | Electrokinetic Remediation Process | 1 |
| | | | Lockheed Martin Missiles and Space Co. And Geokinetics International, Inc. | Electrokinetic Remediation Process | 1 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Aqueous Phase Organic Destruction | 1/2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Morrison Knudsen Corp./Spetstamponazh geologia Enterprises/STG Technologies | Clay-Base Grouting Technology | 1 |
| | | | RECRA Environmental, Inc. | Alternating Current Electrocoagulation Technology | 2 |
| | | | Selentec Environmental Technologies, Inc. | Selentec MAG*SEP Technology | 1 |
| | | | U. of Washington | Adsorptive Filtration | 2 |
| | | | U. of Wisconsin - Madison | Photoelectrocatalytic Degradation and Removal | 2 |
| | | Portable Gas Chromatographs | E&C Williams | Chemical Stabilization Of Mercury Mining Wastes | 1 |
| Ground water (Cont) | Metals (Cont) | Portable Gas Chromatographs (Cont) | HNU Systems, Inc. | HNU GC 311D Portable Gas Chromatograph | 2 |
| | | | Hewlett-Packard Company | Portable Gas Analyzer | 3 |
| | | Solidification/ Stabilization | E&C Williams | Chemical Stabilization of Mercury Mining Wastes | 1 |
| | | | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |
| | | Thermal Destruction | BWX Technologies Inc. | Cyclone Furnace | 1/2 |
| | Organics | Biological Degradation | ASC/EMR Wright-Patterson AFB | Phytoremediation of TCE in Shallow Groundwater | 1 |
| | | | Harding ESE, a MacTech Company | Two-Zone, Plume Interception, In Situ Treatment Strategy | 1/2 |
| | | | Regenesis | Time Released Electron Acceptors & Donors for Accelerated Natural Attenuation | 1 |
| | | Physical/Chemical Treatment | Current Environmental Solutions | Six-Phase Heating of TCE | 1 |
| | | | IT Corporation | KMnO4 (Potassium Permanganate) Oxidation of TCE | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| Ground water (Cont) | | | Geokinetics International, Inc. | Electrokinetics for NSFO Mobilization | 1 |
| | | | Pharmacia Corporation | Lasagna™ In Situ Soil Remediation | 1/2 |
| | | Thermal Destruction | Current Environmental Solutions | Six-Phase Heating of TCE | 1 |
| | | | Terra Therm, Inc | In Situ Thermal Destruction | 1 |
| | PAHs | Physical/ Chemical Treatment | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| | PAHs (Cont) | Spectrometers | SiteLAB Corporation | Ultraviolet Fluorescence Spectroscopy | 3 |
| | PCBs | Biological Degradation | Gas Technology Institute | Chemical and Biological Treatment | 2 |
| | | | Phytokinetics, Inc. | Phytoremediation of Contaminated Soils | 2 |
| | | | Phytokinetics, Inc. | Phytoremediation Process | 1/2 |
| | | | ZENON Environmental Inc. | ZenoGem™ Process | 1 |
| | | Field Portable X-ray Fluorescence | Metorex, Inc. | Field portable X-ray Fluorescence Analysis | 3 |
| | | Physical/Chemical Thermal Desorption | ELI Eco Logic International Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | | KAI Technologies, Inc./Brown and Root Environmental | Radio Frequency Heating | 1 |
| | | | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | | SoilTech ATP Systems, Inc. | Anaerobic Thermal Processor | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Physical/Chemical Treatment | Calgon Carbon Oxidation Technologies | perox-pure™ Chemical Oxidation Technology | 1 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Beam Irradiation | 1/2 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Beam Irradiation | 1/2 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Aqueous Phase Organic Destruction | 1/2 |
| Ground water (Cont) | PCBs (Cont) | Physical/Chemical Treatment (Cont) | Morrison Knudsen Corp./Spetstamponazh geologia Enterprises/STG Technologies | Clay-Base Grouting Technology | 1 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | | U.S. Filter/Zimpro Inc. | Ultraviolet Radiation and Oxidations | 1 |
| | | | U. of Wisconsin - Madison | Photoelectrocatalytic Degradation and Removal | 2 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | HNU Systems, Inc. | HNU GC 311D Portable Gas Chromatograph | 3 |
| | | | Hewlett-Packard Company | Portable Gas Analyzer | 3 |
| | | | Sentex Systems, Inc. | Scentograph Plus II Portable Gas Chromatograph | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | | U.S. EPA | Field Analytical Screening Program PCB Method | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| Ground water (Cont) | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Hanby Environmental Laboratory Procedures, Inc. | Test Kits for Organic Contaminants in Soil and Water | 3 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | PCP | Physical/Chemical Treatment | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | PCP (Cont) | Physical/Chemical Treatment (Cont) | U.S. Filter/Zimpro Inc. | Ultraviolet Radiation and Oxidation | 1 |
| | | Test Kits | Strategic Diagnostics, Inc. | PENTA RISc Test System | 3 |
| | | | Strategic Diagnostics Inc. | RaPID Assay® | 3 |
| | Pesticides | Biological Degradation | BioTrol, Inc. | Biological Aqueous Treatment System | 1 |
| | | | Electrokinetics, Inc. | In Situ Bioremediation by Electrokinetic Injections | 2 |
| | | | Gas Technology Institute | Chemical and Biological Treatment | 2 |
| | | | Phytokinetics, Inc. | Phytoremediation of Contaminated Soils | 3 |
| | | | Phytokinetics, Inc. | Phytoremediation Process | 1/2 |
| | | | ZENON Environmental Inc. | ZenoGem™ Process | 1 |
| | | Physical/Chemical Thermal Desorption | ELI Eco Logic International Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | | KAI Technologies, Inc./Brown and Root Environmental | Radio Frequency heating | 1 |
| | | | SoilTech ATP Systems, Inc. | Anaerobic Thermal Process | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Physical/Chemical Treatment | Calgon Carbon Oxidation Technologies | perox-pure™ Chemical Oxidation Technology | 1 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | High Voltage Environmental Applications, Inc. | High-Energy Electron Beam Irradiation | 1/2 |
| | | | High Voltage Environmental Applications, Inc. | High-Energy Electron Irradiation | 1/2 |
| Ground water (Cont) | Pesticides (Cont) | Physical/Chemical Treatment (Cont) | Matrix Photocatalytic Inc. | Photocatalytic Aqueous Phase Organic Destruction | 1/2 |
| | | | Morrison Knudsen Corp./Spetstamponazh geologia Enterprises/STG Technologies | Clay-Base Grouting Technology | 1 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | | U.S. Filter/Zimpro Inc. | Ultraviolet Radiation and Oxidation | 1 |
| | | | U. of Wisconsin - Madison | Photoelectrocatalytic Degradation and Removal | 2 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | Sentex Sensing Technology, Inc. | Scentograph Plus II Portable Gas Chromatograph | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | | U.S. EPA | Field Analytical Screening Program PCB Method | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Strategic Diagnostics, Inc. | PENTA RISc Test System | 3 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Hanby Environmental Laboratory Procedure, Inc. | Test Kits for Organic Contaminants in Soil and Water | 3 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | Petroleum Hydrocarbons | Biological Degradation | Regenesis | Time Released Electron Acceptors & Donors for Accelerated Natural Attenuation | 1 |
| Ground water (Cont) | Petroleum Hydrocarbons (Cont) | Materials Handling | National Risk Management Research Laboratory, U. of Cincinnati, and FRX, Inc. | Hydraulic Fracturing | 1 |
| | | Physical/Chemical Thermal Desorption | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | Physical/Chemical Treatment | Calgon Carbon Oxidation Technologies | perox-pure™ Chemical Oxidation Technology | 1 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1/2 |
| | | Portable Gas Chromatographs | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | Spectrometers | Horiba Instruments, Inc. | Infrared Analysis | 3 |
| | | | SiteLAB Corporation | Ultraviolet Fluorescence Spectroscopy | 3 |
| | | | Wilks Enterprise, Inc. | Infrared Analysis | 3 |
| | | Test Kits | Idetek, Inc. | Equate® Immunoassay | 3 |
| | Radionuclides | Physical/Chemical Radioactive Waste Treatment | Filter Flow Technology, Inc. | Colloid Polishing Filter Method(R) | 1 |
| | | Physical/Chemical Treatment | Atomic Energy of Canada, Ltd. | Chemical Treatment and Ultrafiltration | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Selentec Environmental Technologies, Inc. | Selentec MAG* SEP Technology | 1 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | Terra Therm, Inc. | In-Situ Thermal Destruction | 1 |
| | SVOCs | Biological Degradation | BioTrol, Inc. | Biological Aqueous Treatment System | 1 |
| | | | Harding ESE, a MacTech Company | Two-Zone, Plume Interception, In Situ Treatment Technology | 1/2 |
| Ground water (Cont) | SVOCs (Cont) | Biological Degradation | Gas Technology Institute | Chemical and Biological Treatment | 2 |
| | | | New York State Dept. of Environmental/ Science Applications International Corp. | In Situ Bioventing Treatment System | 1 |
| | | | ZENON Environmental Inc. | ZenoGem™ Process | 1 |
| | | Physical/Chemical Thermal Desorption | ELI Eco Logic International Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | | KAI Technologies, Inc./Brown and Root Environmental | Radio Frequency Heating | 1 |
| | | | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | | NOVATERRA Associates | In Situ Soil Treatments (Steam/Air Stripping) | 1 |
| | | | SoilTech ATP Systems, Inc. | Anaerobic Thermal Processor | 1 |
| | | | Western Research Institute | Contained Recovery of Oily Wastes (CROW™) | 2 |
| | | Physical/Chemical Treatment | ARS Technologies Inc. | Pneumatic Fracturing Extraction™ and Catalytic Oxidation | 1 |
| | | | Calgon Carbon Oxidation Technologies | perox-pure™ Chemical Oxidation Technology | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | High Voltage Environmental Applications, Inc. | High-Energy Electron Beam Irradiation | 1/2 |
| | | | High Voltage Environmental Applications, Inc. | High-Energy Electron Irradiation | 1 |
| | | | Pulse Sciences, Inc. | X-ray Treatment of Aqueous Solutions | 2 |
| Ground water (Cont) | SVOCs | Physical/Chemical Treatment (Cont) | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | | Terra Vac, Inc. | In Situ and Ex Situ Vacuum Extraction | 1 |
| | | | U. of Wisconsin - Madison | Photoelectrocatalytic Degradation and Removal | 2 |
| | | | Roy F. Weston, Inc./IEG Technologies | UVB - Vacuum Vaporizing Well | 1 |
| | | | Xerox Corp. | 2-PHASE™ EXTRACTION Process | 1 |
| | | Portable Gas Chromatographs | Analytical and Remedial Technology, Inc. | Automated Sampling and Analytical Platform | 3 |
| | | | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | U.S. EPA | Field Analytical Screening Program PCB Method | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Strategic Diagnostics, Inc. | RaPID Assay® | 3 |
| | | Thermal Destruction | BWX Technologies Inc. | Cyclone Furnace | 1/2 |
| | | | Texaco Inc. | Texaco Gasification process | 1 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Other | Berkeley Environmental Restoration Center | In Situ Steam Enhanced Extraction Process | 1 |
| | VOCs | Biological Degradation | Argonne National Laboratory | Development of Phytoremediation | 1 |
| | | | ASC/EMR Wright-Patterson AFB | Phytoremediation of TCE in Shallow Groundwater | 1 |
| Ground water (Cont) | VOCs (Cont) | Biological Degradation (Cont) | Billings and Associates, Inc. | Subsurface Volatilization and Ventilation System (SVVS®) | 1 |
| | | | Bio-Rem, Inc. | Augmented In Situ Subsurface Bioremediation Process | 1 |
| | | | BioTrol, Inc. | Biological Aqueous Treatment System | 1 |
| | | | Earth Tech/ Westinghouse Savannah River Company | Enhanced In Situ Bioremediation of Chlorinated Compounds in Groundwater | 1 |
| | | | Electrokinetics, Inc. | In Situ Bioremediation by Electrokinetic Injection | 2 |
| | | | Earth Tech, Inc. | In Situ Enhanced Bioremediation of Groundwater | 1 |
| | | | New York State Dept. of Environmental/ Science Applications International Corp. | In Situ Bioventing Treatment System | 1 |
| | | | New York State Dept. of Environmental Conservation/SBP Technologies, Inc. | Groundwater Circulation Biological Treatment Process | 1 |
| | | | Phytokinetics, Inc. | Phytoremediation of Contaminated Soils | 2 |
| | | | Phytokinetics, Inc. | Phytoremediation Process | 1/2 |
| | | | ZENON Environmental Inc. | ZenoGem™ Process | 1 |
| | | Materials Handling | National Risk Management Research Laboratory, U. of Cincinnati, and FRX, Inc. | Hydraulic Fracturing | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Physical/Chemical Thermal Desorption | Hughes Environmental Systems, Inc. | Steam Enhanced Recovery Process | 1 |
| | | | KAI Technologies, Inc./Brown and Root Environmental | Radio Frequency Heating | 1 |
| Ground water (Cont) | VOCs (Cont) | Physical/Chemical Thermal Desorption | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | | NOVATERRA Associates | In Situ Soil Treatments (Steam/Air Stripping) | 1 |
| | | | Rochem Separation Systems, Inc. | Rochem Disc Tube™ Module System | 1 |
| | | | SoilTech ATP Systems, Inc. | Anaerobic Thermal Processor | 1 |
| | | | Western Research Institute | Contained Recovery of Oily Wastes (CROW™) | 2 |
| | | Physical/Chemical Treatment | ARS Technologies, Inc. | Pneumatic Fracturing Extraction™ and Catalytic Oxidation | 1 |
| | | | Arizona State U./ Zentox Corp. | Photocatalytic Oxidation with Air Stripping | 2 |
| | | | AWD Technologies, Inc. | Aqua Detox(R)/SVE Systems | 1 |
| | | | Calgon Carbon Oxidation Technologies | perox-pure™ Chemical Oxidation Technology | 1 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | Radian International LLC | Integrated AquaDetox Steam Vacuum Stripping and Soil Vapor Extraction/Reinjection | 1 |
| | | | Mactec-SBP Technologies Company, LLC | No VOCs™ In-Well Stripping Technology | 1 |
| | | | EnviroMetal Technologies, Inc. | In Situ and Ex Situ Metal Enhanced Abiotic Degradation of Dissolved Halogenated Organic Compounds in Groundwater | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Irradiation | 1/2 |
| | | | IT Corporation | KMnO4 Oxidation of TCE | 1 |
| Ground water (Cont) | VOCs (Cont) | Physical/Chemical Treatment | KSE, Inc. | Adsorption-Integrated-Reaction Process | 2 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Aqueous Phase Organic Destruction | 1/2 |
| | | | Morrison Knudsen Corp./Spetstamponazh geologia Enterprises/STG Technologies | Clay-Base Grouting Technology | 1 |
| | | | Pulse Sciences, Inc. | X-ray Treatment of Aqueous Solutions | 2 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | | Terra Vac, Inc. | In Situ and Ex Situ Vacuum Extraction | 1 |
| | | | U.S. Filter/Zimpro Inc. | Ultraviolet Radiation and Oxidation | 1 |
| | | | U. of Nebraska - Lincoln | Center Pivot Spray Irrigation System | 1 |
| | | | UV Technologies, Inc. | PhotoCAT™ Process | 2 |
| | | | Roy F. Weston, Inc. | Ambersorb® 563 Adsorbent | 2 |
| | | | Roy F. Weston, Inc./IEG Technologies | UVB - Vacuum Vaporizing Well | 1 |
| | | | Xerox Corp. | 2-PHASE™ EXTRACTION Process | 1 |
| | | | ZENON Environmental Inc. | Cross-Flow Pervaporation System | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | HNU Systems, Inc. | HNU GC 311D Portable Gas Chromatograph | 3 |
| | | | Hewlett-Packard Company | Portable Gas Analyzer | 3 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| Ground water (Cont) | | | Photovac Monitoring Instruments | PE Photovac Voyager Portable Gas Chromatograph | 3 |
| | VOCs (Cont) | Portable Gas Chromatographs (Cont) | Sentex Systems, Inc. | Scentograph Plus II Portable Gas Chromatograph | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | | U.S. EPA | Field Analytical Screening Program PCB Method | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Hanby Environmental Laboratory Procedure, Inc. | Test Kits for Organic Contaminants in Soil and Water | 3 |
| | | | Strategic Diagnostics Inc. | RaPID Assay® | 3 |
| | | Thermal Destruction | Texaco, Inc. | Texaco Gasification Process | 1 |
| | Not Applicable | Capping/ Containment | U.S. EPA NRMRL | Alterative Cover Assessment Program (ACAP) | 1 |
| | Other | Physical/Chemical Treatment | North American Technologies Group, Inc. | Oleophilic Amine-Coated Ceramic Chip | 1 |
| | | | RECRA Environmental, Inc. | Alternating Electrocoagulation Technology | 2 |
| Leachate | Aromatic VOCs | Biological Degradation | BioTrol, Inc. | Biological Aqueous Treatment System | 1 |
| | | | Electrokinetics, Inc. | In Situ Bioremediation by Electrokinetic Injection | 2 |
| | | | ZENON Environmental Inc. | ZenoGem™ Process | 1 |
| | | Physical/Chemical Thermal Desorption | NOVATERRA Associates | In Situ Soil Treatments (Steam/Air Stripping) | 1 |
| | | | Rochem Separation Systems, Inc. | Rochem Disc Tube™ Module System | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Physical/Chemical Treatment | CF Systems, Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| Leachate (Cont) | Aromatic VOCs (Cont) | Physical/Chemical Treatment (Cont) | High Voltage Environmental Applications, Inc. | High Energy Electron Beam Irradiation | 1/2 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Irradiation | 1 |
| | | | Magnum Water Technology | CA-OX® Process | 1 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Aqueous Phase Organic Destruction | 1/2 |
| | | | Pulse Sciences, Inc. | X-ray Treatment of Aqueous Solutions | 2 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | | ZENON Environmental Inc. | Cross-Flow Pervaporation System | 1 |
| | | Portable Gas Chromatographs | Analytical and Remedial Technology, Inc. | Automated Sampling and Analytical Platform | 3 |
| | | | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | HNU Systems, Inc. | HNU GC 311D Portable Gas Chromatograph | 3 |
| | | | Sentex Systems, Inc. | Scentograph Plus II Portable Gas Chromatograph | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | | U.S. EPA | Field Analytical Screening Program PCB Methods | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Hanby Environmental Laboratory procedure, Inc. | Test Kits for Organic Contaminants in Soil and Water | 3 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| Leachate (Cont) | Cyanide | Biological Degradation | Pintail Systems, Inc. | Spent Ore Bioremediation Process | 1/2 |
| | Diesel | Spectrometers | SiteLAB Corporation | Ultraviolet Fluorescence Spectroscopy | 3 |
| | Dioxins | Physical/Chemical Thermal Desorption | ELI Eco Logic International Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | Physical/Chemical Treatment | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | High Voltage Environmental Applications, Inc. | High-Energy Electron Irradiation | 1/2 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Aqueous Phase Organic Destruction | 1/2 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Strategic Diagnostics Inc. | RaPID Assay® | 3 |
| | | Thermal Destruction | BWX Technologies Inc. | Cyclone Furnace | 1/2 |
| | Explosives | Physical/Chemical Thermal Desorption | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | Physical/Chemical Treatment | U.S. Filter/Zimpro Inc. | Ultraviolet Radiation and Oxidation | 1 |
| | Furans | Physical/Chemical Thermal Desorption | ELI Eco Logic International Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | Physical/Chemical Treatment | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| Leachate (Cont) | Furans (Cont) | Physical/Chemical Treatment | High Voltage Environmental Applications, Inc. | High-Energy Electron Irradiation | 1/2 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Aqueous Phase Organic Destruction | 1/2 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Strategic Diagnostics Inc. | RaPID Assay® | 3 |
| | | Thermal Destruction | BWX Technologies Inc. | Cyclone Furnace | 1/2 |
| | Gasoline | Spectrometers | SiteLAB Corporation | Ultraviolet Fluorescence Spectroscopy | 3 |
| | Halogenated VOCs | Biological Degradation | BioTrol, Inc. | Methanotrophic Bioreactor System | 2 |
| | | | ZENON Environmental Inc. | ZenoGem™ Process | 1 |
| | | Physical/Chemical Thermal Desorption | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | | NOVATERRA Associates | In-Situ Soil Treatments (Steam/Air Stripping) | 1 |
| | | Physical/Chemical Treatment | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | EnviroMetal Technologies Inc. | In Situ and Ex Situ Metal Enhanced Abiotic Degradation of Dissolved Halogenated Organic Compounds in Groundwater | 1 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Beam Irradiation | 1/2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| Leachate (Cont) | Halogenated VOCs (Cont) | Physical/Chemical Treatment (Cont) | High Voltage Environmental Applications, Inc. | High Energy Electron Irradiation | 1/2 |
| | | | Magnum Water Technology | CAV-OX® Process | 1 |
| | | | Matrix Photocatalytic Aqueous Phase Organic Destruction | Photocatalytic Aqueous Phase Organic Destruction | 1/2 |
| | | | Pulse Sciences, Inc. | X-ray Treatment of Aqueous Solutions | 2 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | | U.S. Filter/Zimpro Inc. | Ultraviolet Radiation and Oxidation | 1 |
| | | | UV Technologies, Inc. | PhotoCAT™ Process | 2 |
| | | | Roy F. Weston, Inc. | Ambersorb® 563 Adsorbent | 2 |
| | | | ZENON Environmental Inc. | Cross-Flow Pervaporation System | 1 |
| | | Portable Gas Chromatographs | Analytical and Remedial Technology, Inc. | Automated Sampling and Analytical Platform | 3 |
| | | | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | Sentex Systems, Inc | Scentograph Plus II Portable Gas Chromatograph | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | | U.S. EPA | Field Analytical Screening Program PCB Method | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Strategic Diagnostics, Inc. | RaPID Assay® | 3 |
| Leachate (Cont) | Halogenated VOCs (Cont) | Thermal Destruction | Energy and Environmental Research Corp. | Hybrid Fluidized Bed System | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | Heavy Metals | Thermal Destruction | IGT | Thermal Sediment Reuse Technologies | 1 |
| | Herbicides | Biological Degradation | BioTrol, Inc. | Biological Aqueous Treatment System | 1 |
| | | | Electrokinetics, Inc. | In Situ Bioremediation by Electrokinetic Injection | 2 |
| | | | ZENON Environmental Inc. | ZenoGem™ Process | 1 |
| | | Physical/Chemical Thermal Desorption | ELI Eco Logic International Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | Physical/Chemical Treatment | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | High Voltage Environmental Applications, Inc. | High-Energy Electron Irradiation | 1/2 |
| | | | Magnum Water Technology | CAV-OX® Process | 1 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Water Treatment | 1 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Strategic Diagnostics, Inc. | RaPID Assay® | 3 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| Leachate (Cont) | Inorganics | Thermal Destruction | IGT | Thermal Sediment Reuse Technology | 1 |
| | Metals | Biological Degradation | Colorado Dept. Of Public Health and Environment | Wetlands-Based Treatment | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Pintail Systems, Inc. | Biomineralization of Metals | 2 |
| | | | Pintail Systems, Inc. | Spent Ore Bioremediation Process | 1 |
| | | Field Portable X-ray Fluorescence | Metorex, Inc. | Field Portable X-ray Fluorescence Analysis | 3 |
| | | Physical/Chemical Radioactive Waste Treatment | Filter Flow Technology, Inc. | Heavy Metals and Radionuclide Polishing Filter | 1 |
| | | Physical/Chemical Thermal Desorption | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | | Rochem Separation Systems, Inc. | Rochem Disc Tube™ Module System | 1 |
| | | Physical/Chemical Treatment | Atomic Energy of Canada, Ltd. | Chemical Treatment and Ultrafiltration | 2 |
| | | | Atomic Energy of Canada, Ltd. | Ultrasonic-Aided Leachate Treatment | 2 |
| | | | E.I. DuPont de Nemours and Co., and Oberlin Filter Co. | Membrane Microfiltration | 1 |
| | | | Dynaphore, Inc. | FORAGER® Sponge | 1 |
| | | | EPOC Water, Inc. | Precipitation, Microfiltration, and Sludge Dewatering | 1 |
| | | | General Environmental Corp. | CURE® Electrocoagulation Wastewater Treatment System | 1 |
| | | | Geokinetics, International, Inc. | Electrokinetic Remediation Process | 1 |
| | | | Lewis Environmental Services, Inc./ Hickson Corp. | Chromated Copper Arsenate Soil Leaching Process | 2 |
| Leachate (Cont) | Metals (Cont) | Physical/Chemical Treatment (Cont) | Lockheed Martin Missiles and Space Co. and Geokinetics International, Inc. | Electrokinetic Remediation Process | 1 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Water Treatment | 1/2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Morrison Knudsen Corp./Spetstamponazh geologia Enterprises/ STG Technologies | Clay-Base Grouting Technology | 1 |
| | | | RECRA Environmental, Inc. | Alternating Current Electrocoagulation Technology | 2 |
| | | | Region 8 and State of Colorado | Multiple Innovative Passive Mine Drainage Technologies | 1 |
| | | | Selentec Environmental Technologies, Inc. | Selentec MAG*SEP Technology | 1 |
| | | | U. of Washington | Adsorption Filtration | 2 |
| | | Portable Gas Chromatographs | HNU Systems, Inc. | HNU GC 311D Portable Gas Chromatograph | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air System, Inc. | PO*WW*ER™ Technology | 1 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | Energy and Environmental Research Corp. | Hybrid Fluidized Bed System | 2 |
| | Organics | Thermal Destruction | IGT | Thermal Sediment Reuse Technology | 1 |
| | PAHs | Physical/Chemical Treatment | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | Spectrometers | SiteLAB Corporation | Ultraviolet Fluorescence Spectroscopy | 3 |
| Leachate (Cont) | PAHs (Cont) | Thermal Destruction (Cont) | IGT | Thermal Sediment Reuse Technology | 1 |
| | PCBs | Biological Degradation | ZENON Environmental Inc. | ZenoGem™ Process | 1 |
| | | Field Portable X-ray Fluorescence | Metorex, Inc. | Field Portable X-ray Fluorescence Analysis | 3 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Physical/Chemical Thermal Desorption | ELI Eco Logic International Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | Physical/Chemical Treatment | Calgon Carbon Oxidation Technologies | perox-pure™ Chemical Oxidation Technology | 1 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | High Voltage Environmental Applications, Inc. | High-Energy Electron Irradiation | 1/2 |
| | | | High Voltage Environmental Applications, Inc. | High-Energy Electron Irradiation | 1/2 |
| | | | Magnum Water Technology | CAV-OX® Process | 1 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Water Treatment | 1/2 |
| | | | Morrison Knudsen Corp./Spetstamponazh geologia Enterprises/ STG Technologies | Clay-Base Grouting Technology | 1 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | | U.S. Filter/Zimpro Inc. | Ultraviolet Radiation and Oxidation | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | HNU Systems, Inc. | HNU GC 311D Portable Gas Chromatograph | 3 |
| Leachate (Conte) | PCBs (Cont) | Portable Gas Chromatographs (Cont) | Sentex Sensing Technology, Inc. | Scentograph Plus II Portable Gas Chromatograph | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | | U.S. EPA | Field Analytical Screening Program PCB Methods | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Strategic Diagnostics, Inc. | PENTA RISc Test Systems | 3 |
| | | | Hanby Environmental Laboratory Procedure, Inc. | Test Kits for Organic Contaminants in Soil and Water | 3 |
| | | | Energy and Environmental Research Corp. | Hybrid Fluidized Bed System | 2 |
| | | Thermal Destruction | IGT | Thermal Sediment Reuse Technology | 1 |
| | PCP | Physical/Chemical Treatment | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | | U.S. Filter/Zimpro Inc. | Ultraviolet Radiation and Oxidation | 1 |
| | | Test Kits | Strategic Diagnostics, Inc. | PENTA RISc Test System | 3 |
| | | | Strategic Diagnostics, Inc. | RaPID Assay® | 3 |
| | Pesticides | Biological Degradation | BioTrol, Inc. | Biological Aqueous Treatment System | 1 |
| | | | Electrokinetics, Inc. | In Situ Bioremediation by Electrokinetic Injection | 2 |
| | | | ZENON Environmental Inc. | ZenoGem™ Process | 1 |
| | | Physical/Chemical Thermal Desorption | ELI Eco Logic International Inc. | Gas-Phase Chemical Reduction Process | 1 |
| Leachate (Cont) | Pesticides (Cont) | Physical/Chemical Treatment | Calgon Carbon Oxidation Technologies | perox-pure™ Chemical Oxidation Technology | 1 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | High Voltage Environmental Applications, Inc. | High-Energy Electron Beam Irradiation | 1/2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | High Voltage Environmental Applications, Inc. | High-Energy Electron Irradiation | 1/2 |
| | | | Magnum Water Technology | CAV-OX® Process | 1 |
| | | | Photocatalytic Air Treatment Photocatalytic Inc. | Photocatalytic Water Treatment | 1 |
| | | | Morrison Knudsen Corp./Spetstamponazh geologia Enterprises/ STG Technologies | Clay-Base Grouting Technology | 1 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | | U.S. Filter/Zimpro Inc. | Ultraviolet Radiation and Oxidation | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | Sentex Sensing Technology, Inc. | Scentograph Plus II Portable Gas Chromatograph | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | | U.S. EPA | Field Analytical Screening Program PCB Method | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Strategic Diagnostics, Inc. | PENTA RISc Test System | 3 |
| Leachate (Cont) | Pesticides (Cont) | Test Kits (Cont) | Hanby Environmental Laboratory Procedure, Inc. | Test Kits for Organic Contaminants in Soil and Water | 3 |
| | | | Strategic Diagnostics, Inc. | RaPID Assay® | 3 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Energy and Environmental Research Corp. | Hybrid Fluidized Bed System | 2 |
| | Petroleum Hydrocarbons | Physical/Chemical Thermal Desorption | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | Physical/Chemical Treatments | Calgon Carbon Oxidation Technologies | perox-pure™ Chemical Oxidation Technology | 1 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | Portable Gas Chromatographs | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | Spectrometers | Horiba Instruments, Inc. | Infrared Analysis | 3 |
| | | | SiteLAB Corporation | Ultraviolet Fluorescence Spectroscopy | 3 |
| | Radionuclides | Physical/Chemical Radioactive Waste Treatment | Filter Flow Technology, Inc. | Heavy Metals and Radionuclide Polishing Filter | 1 |
| | | Physical/Chemical Treatment | Atomic Energy of Canada, Ltd. | Chemical Treatment and Ultrafiltration | 2 |
| | | | Atomic Energy of Canada, Ltd. | Ultrasonic-Aided Leachate Treatment and Ultrafiltration | 3 |
| | | | Selentec Environmental Technologies, Inc. | Selentec MAG*SEP Technology | 1 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | Terra Therm | In Situ Thermal Destruction | 1 |
| Leachate (Cont) | SVOCs | Biological Degradation | BioTrol, Inc. | Biological Aqueous Treatment System | 1 |
| | | | ZENON Environmental Inc. | ZenoGem™ Process | 1 |
| | | Physical/Chemical Thermal Desorption | ELI Eco Logic International Inc. | Gas-Phase Chemical Reduction Process | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | | Novaterra Associates | In Situ Soil Treatments (Steam/Air Stripping) | 1 |
| | | Physical/Chemical Treatment | Calgon Carbon Oxidation Technologies | perox-pure™ Chemical Oxidation Technology | 1 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | High Voltage Environmental Applications, Inc. | High-Energy Electron Irradiation | 1/2 |
| | | | High Voltage Environmental Applications, Inc. | High-Energy Electron Irradiation | 1 |
| | | | Pulse Sciences, Inc. | X-ray Treatment of Aqueous Solutions | 2 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | Portable Gas Chromatographs | Analytical and Remedial Technology, Inc. | Automated Sampling and Analytical Platform | 3 |
| | | | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | U.S. EPA | Field Analytical Screening Program PCB Method | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| Leachate (Cont) | SVOCs (Cont) | Test Kits | Strategic Diagnostics, Inc. | RaPID Assay® | 3 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | VOCs | Biological Degradation | BioTrol, Inc. | Biological Aqueous Treatment System | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Electrokinetics, Inc. | In Situ Bioremediation by Electrokinetic Injection | 2 |
| | | | ZENON Environmental Inc. | ZenoGem™ Process | 1 |
| | | Physical/Chemical Thermal Desorption | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | | Novaterra Associates | In Situ Soil Treatment (Steam/Air Stripping) | 1 |
| | | | Rochem Separation Systems, Inc. | Rochem Disc Tube™ Module System | 1 |
| | | Physical/Chemical Treatment | Calgon Carbon Oxidation Technologies | perox-pure™ Chemical Oxidation Technology | 1 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | EnviroMetal Technologies Inc. | In Situ and Ex Situ Metal Enhanced Abiotic Degradation of Dissolved Halogenated Organic Compounds in Groundwater | 1 |
| | | | High Voltage Environmental Applications, Inc. | High-Energy Electron Irradiation | 1/2 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Water Treatment | 1/2 |
| | | | Morrison Knudsen Corp./Spetstamponazh geologia Enterprises/ STG Technologies | Clay-Base Grouting Technology | 1 |
| | | | Pulse Sciences, Inc. | X-ray Treatment of Aqueous Solutions | 2 |
| Leachate (Cont) | VOCs (Cont) | Physical/Chemical Treatment (Cont) | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | | U.S. Filter/Zimpro Inc. | Ultraviolet Radiation and Oxidation | 1 |
| | | | UV Technologies, Inc. | PhotoCAT™ Process | 2 |
| | | | Roy F. Weston, Inc. | Ambersorb® 563 Adsorbent | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | ZENON Environmental, Inc. | Cross-Flow Pervaporation System | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | HNU Systems, Inc. | HNU GC 311D Portable Gas Chromatograph | 3 |
| | | | Sentex Sensing Technology, Inc. | Scentograph Plus II Portable Gas Chromatograph | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | | U.S. EPA | Field Analytical Screening Program PCB Method | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Hanby Environmental Laboratory Procedure, Inc. | Test Kits for Organic Contaminants in Soil and Water | 3 |
| | | | Strategic Diagnostics, Inc. | RaPID Assay® | 3 |
| | | Thermal Destruction | Energy and Environmental Research Corp. | Hybrid Fluidized Bed System | 2 |
| | Not Applicable | Capping/ Containment | Wilder Construction Co. | Matcon Modified Asphalt Cap | 1 |
| | Other | Physical/Chemical Treatment | North American Technologies Group, Inc. | Oleophilic Amine-Coated Ceramic Chip | 1 |
| Leachate (Cont) | Other (Cont) | Physical/Chemical Treatment (Cont) | RECRA Environmental, Inc. | Alternating Current Electrocoagulation Technology | 2 |
| Liquid | Aromatic VOCs | Biological Degradation | Billings and Associates, Inc. | Subsurface Volatilization and Ventilation System (SVVS® ) | 1 |
| | | | Bio-Rem, Inc. | Augmented In Situ Subsurface Bioremediation Process | 1 |
| | | | BioTrol, Inc. | Biological Aqueous Treatment System | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Electrokinetics, Inc. | In Situ Bioremediation by Electrokinetic Injection | 2 |
| | | | Harding ESE, a Mactec Co. | Two-Zone Plume Interception, In Situ Treatment Technology | 1/2 |
| | | | New York State Dept. Of Environmental Conservation/R.E. Wright Environmental, Inc. | In Situ Bioventing Treatment System | 1 |
| | | | IT Corporation | Oxygen Microbubble In Situ Bioremediation | 2 |
| | | | ZENON Environmental Inc. | ZenoGem™ Process | 1 |
| | | Materials Handling | National Risk Management Research Laboratory, U. of Cincinnati, and FRX, Inc. | Hydraulic Fracturing | 1 |
| | | Physical/Chemical Thermal Desorption | Hughes Environmental Systems, Inc. | Steam Enhanced Recovery Process | 1 |
| | | | Rochem Separation Systems, Inc. | Rochem Disc Tube™ Module System | 1 |
| | | | SoilTech ATP Systems, Inc. | Anaerobic Thermal Processor | 1 |
| | | | Western Research Institute | Contained Recovery of Oil Wastes (CROW™) | 2 |
| | | Physical/Chemical Treatment | ARS Technologies, Inc. | Pneumatic Fracturing Extraction™ and Catalytic Oxidation | 1 |
| Liquid (Cont) | Aromatic VOCs (Cont) | Physical/Chemical Treatment (Cont) | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Beam Irradiation | 1/2 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Irradiation | 1/2 |
| | | | KSE, Inc. | Adsorption-Integrated-Reaction Process | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Matrix Photocatalytic Inc. | Photocatalytic Water Treatment | 1/2 |
| | | | Pulse Sciences, Inc. | X-ray Treatment of Aqueous Solutions | 2 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | | Terra Vac, Inc. | In Situ and Ex Situ Vacuum Extraction | 1 |
| | | | U. of Nebraska - Lincoln | Center Pivot Spray Irrigation System | 1 |
| | | | Roy F. Weston, Inc./IEG Technologies | UVB - Vacuum Vaporizing Well | 1 |
| | | | Xerox Corp. | 2-PHASE™ EXTRACTION Process | 1 |
| | | | ZENON Environmental Inc. | Cross-Flow Pervaporation System | 1 |
| | | Portable Gas Chromatographs | Analytical and Remedial Technology, Inc. | Automated Sampling and Analytical Platform | 3 |
| | | | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | HNU Systems, Inc. | HNU GC 311D Portable Gas Chromatograph | 3 |
| | | | Photovac Monitoring Instruments | PE Photovac Voyager Portable Gas Chromatograph | 3 |
| | | | Sentex Sensing Technology, Inc. | Scentograph Plus II Portable Gas Chromatograph | 3 |
| Liquid (Cont) | Aromatic VOCs (Cont) | Portable Gas Chromatographs (Cont) | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | | U.S. EPA | Field Analytical Screening Program PCB Method | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Hanby Environmental Laboratory Procedure, Inc. | Test Kits for Organic Contaminants in Soil and Water | 3 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Thermal Destruction | Texaco Inc. | Texaco Gasification Process | 1 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | Cyanide | Biological Degradation | Pintail Systems, Inc. | Spent Ore Bioremediation Process | 1 |
| | Diesel | Materials Handling | National Risk Management Research Laboratory, U. of Cincinnati, and FRX, Inc. | Hydraulic Fracturing | 1 |
| | | Spectrometer | SiteLAB Corporation | Ultraviolet Fluorescence Spectroscopy | 3 |
| | Dioxins | Physical/Chemical Thermal Desorption | ELI Eco Logic International, Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | | SoilTech ATP Systems, Inc. | Anaerobic Thermal Processor | 1 |
| | | Physical/Chemical Treatment | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Irradiation | 1/2 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Water Treatment | 1/2 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| Liquid (Cont) | Dioxins (Cont) | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Strategic Diagnostics, Inc. | RaPID Assay® | 3 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | Explosives | Physical/Chemical Thermal Desorption | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | Physical/Chemical Treatment | U.S. Filter/Zimpro Inc. | Ultraviolet Radiation and Oxidation | 1 |
| | Furans | Physical/Chemical Thermal Desorption | ELI Eco Logic International Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | | SoilTech ATP Systems, Inc. | Anaerobic Thermal Processor | 1 |
| | | Physical/Chemical Treatment | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Irradiation | 1/2 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Water Treatment | 1/2 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |
| Liquid (Cont) | Furans (Cont) | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Strategic Diagnostics, Inc. | RaPID Assay® | 3 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | Gasoline | Materials Handling | National Risk Management Research Laboratory, U. of Cincinnati, and FRX, Inc. | Hydraulic Fracturing | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Spectrometer | SiteLAB Corporation | Ultraviolet Fluorescence Spectroscopy | 3 |
| | Halogenated VOCs | Biological Degradation | ASC/EMR Wright-Patterson AFB | Phytoremediation of TCE-Contaminated Shallow Groundwater | 1 |
| | | | Harding ESE, a Mactec Co. | Two-Zone Plume Interception, In Situ Treatment Technology | 1/2 |
| | | | Bio-Rem, Inc. | Augmented In Situ Subsurface Bioremediation Process | 1 |
| | | | BioTrol, Inc. | Methanotrophic Bioreactor System | 2 |
| | | | New York State Dept. Of Environmental Conservation/R.E. Wright Environmental, Inc. | In Situ Bioventing Treatment System | 1 |
| | | | IT Corporation | Oxygen Microbubble In Situ Bioremediation | 2 |
| | | | ZENON Environmental Inc. | ZenoGem™ Process | 1 |
| | | Materials Handling | National Risk Management Research Laboratory, U. of Cincinnati, and FRX, Inc. | Hydraulic Fracturing | 1 |
| Liquid (Cont) | Halogenated VOCs (Cont) | Physical Chemical Treatment - Biological Degradation | Pharmacia Corporation | Lasagna™ In Situ Soil Remediation | 1/2 |
| | | Physical/Chemical Thermal Desorption | Hughes Environmental Systems, Inc. | Steam Enhanced Recovery Process | 1 |
| | | | KAI Technologies, Inc./Brown and Root Environmental | Radio Frequency Heating | 1 |
| | | | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | | SoilTech ATP Systems, Inc. | Anaerobic Thermal Process | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Western Research Institute | Contained Recovery of Oily Wastes (CROW™) | 2 |
| | | Physical/Chemical Treatment | ARS Technologies, Inc. | Pneumatic Fracturing Extraction™ and Catalytic Oxidation | 1 |
| | | | Arizona State U/Zentox Corp. | Photocatalytic Oxidation with Air Stripping | 2 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Beam Irradiation | 1/2 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Irradiation | 1/2 |
| | | | KSE, Inc. | Adsorption-Integrated-Reaction Process | 2 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Water Treatment | 1/2 |
| | | | Pulse Sciences, Inc. | X-ray Treatment of Aqueous Solutions | 2 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| Liquid (Cont) | Halogenated VOCs (Cont) | Physical/Chemical Treatment (Cont) | Terra Vac, Inc. | In Situ and Ex Situ Vacuum Extraction | 1 |
| | | | U.S. Filter/Zimpro Inc. | Ultraviolet Radiation and Oxidation | 1 |
| | | | U. of Nebraska - Lincoln | Center Pivot Spray Irrigation System | 1 |
| | | | UV Technologies, Inc. | PhotoCAT™ Process | 2 |
| | | | Roy F. Weston, Inc./IEG Technologies | Ambersorb 563 Adsorbent | 2 |
| | | | Roy F. Weston, Inc./IEG Technologies | UVB - Vacuum Vaporizing Well | 1 |
| | | | Xerox Corp. | 2-PHASE™ EXTRACTION Process | 1 |
| | | | ZENON Environmental Inc. | Cross-Flow Pervaporation System | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Portable Gas Chromatographs | Analytical and Remedial Technology, Inc. | Automated Sampling and Analytical Platform | 3 |
| | | | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | Photovac Monitoring Instruments | PE Photovac Voyager Portable Gas Chromatograph | 3 |
| | | | Sentex Sensing Technology, Inc. | Scentograph Plus II Portable Gas Chromatograph | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | | U.S. EPA | Field Analytical Screening Program PCB Method | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Strategic Diagnostics, Inc. | RaPID Assay® | 3 |
| | | Thermal Destruction | Texaco Inc. | Texaco Gasification Process | 1 |
| Liquid (Cont) | Halogenated VOCs (Cont) | Thermal Destruction (Cont) | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | Heavy Metals | Chemical Treatment | Concurrent Technologies | Organics Destruction and Metals Stabilization | 2 |
| | | Field Portable X-ray Fluorescence | HNU Systems, Inc. | HNU Source Excited Fluorescence Analyzer-Portable (SEFA-P) X-ray Fluorescence Analyzer | 3 |
| | | Solidification/ Stabilization | Gas Technology Institute | Cement-Lock Technology | 1 |
| | | Thermal Destruction | Gas Technology Institute | Cement-Lock Technology | 1 |
| | Herbicides | Biological Degradation | BioTrol, Inc. | Biological Aqueous Treatment System | 1 |
| | | | Electrokinetics, Inc. | In Situ Bioremediation by Electrokinetic Injection | 2 |
| | | | ZENON Environmental Inc. | ZenoGem™ Process | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Physical Chemical Treatment - Biological Degradation | Pharmacia Corporation | Lasagna™ In Situ Soil Remediation | 1/2 |
| | | Physical/Chemical Thermal Desorption | ELI Eco Logic International Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | | SoilTech ATP Systems, Inc. | Anaerobic Thermal Processor | 1 |
| | | Physical/Chemical Treatment | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 4 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Irradiation | 1/2 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Water Treatment | 1/2 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| Liquid (Cont) | Herbicides (Cont) | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Strategic Diagnostics, Inc. | RaPID Assay® | 3 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | Inorganics | Chemical Treatment | Kvaerner Energy & Environment | Chemical Treatment | 2 |
| | | Field Portable X-ray Fluorescence | HNU Systems, Inc. | HNU Source Excited Fluorescence Analyzer-Portable (SEFA-P) X-ray Fluorescence Analyzer | 3 |
| | | Solidification/ Stabilization | Gas Technology Institute | Cement-Lock Technology | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Thermal Destruction | Gas Technology Institute | Cement-Lock Technology | 1 |
| | Metals | Biological Degradation | Colorado Dept. of Public Health and Environment | Wetlands-Based Treatment | 2 |
| | | | Pintail Systems, Inc. | Biomineralization of Metals | 2 |
| | | | Pintail Systems, Inc. | Spent ore Bioremediation Process | 1 |
| | | | Resource Management & Recovery | AlgaSORB© Biological Sorption | 2 |
| | | Field Portable X-ray Fluorescence | HNU Systems, Inc. | HNU Source Excited Fluorescence Analyzer-Portable (SEFA-P) X-ray Fluorescence Analyzer | 3 |
| | | | Metorex, Inc. | Field Portable X-ray Fluorescence Analysis | 3 |
| | | Physical/Chemical Treatment - Biological Degradation | Pharmacia Corporation | Lasagna™ In Situ Soil Remediation | 1/2 |
| Liquid (Cont) | Metals (Cont) | Physical/Chemical Radioactive Waste Treatment | Filter Flow Technology, Inc. | Heavy Metals and Radionuclide Polishing Filter | 1 |
| | | Physical/Chemical Thermal Desorption | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | | Rochem Separation Systems, Inc. | Rochem Disc TUBE™ Module System | 1 |
| | | Physical/Chemical Treatment | Atomic Energy of Canada, Ltd. | Chemical Treatment and Ultrafiltration | 2 |
| | | | E.I. DuPont de Nemours and Co. and Oberlin Filter Co. | Membrane Microfiltration | 1 |
| | | | Dynaphore, Inc. | FORAGER® Sponge | 1 |
| | | | EPOC Water, Inc. | Precipitation, Microfiltration, and Sludge Dewatering | 1 |
| | | | General Environmental Corp. | CURE® Electrocoagulation Wastewater Treatment System | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Geokinetics, International, Inc. | Electrokinetic Remediation Process | 1 |
| | | | Lewis Environmental Services, Inc./ Hickson Corp. | Chromated Copper Arsenate Soil Leaching Process | 2 |
| | | | Lockheed Martin Missiles and Space Co. and Geokinetics International, Inc. | Electrokinetic Remediation process | 2 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Water Treatment | 1/2 |
| | | | Morrison Knudsen Corp./Spetstamponazh geologia Enterprises/STG Technologies | Clay-Base Grouting Technology | 1 |
| | | | RECRA Environmental, Inc. | Alternating Current Electrocoagulation Technology | 2 |
| | | | Selentec Environmental Technologies, Inc. | Selentec MAG*SEP Technology | 1 |
| Liquid (Cont) | Metals (Cont) | Physical/Chemical Treatment (Cont) | U. of Washington | Adsorptive Filtration | 2 |
| | | | U. of Wisconsin - Madison | Photoelectrocatalytic Degradation and Removal | 2 |
| | | Portable Gas Chromatographs | HUN Systems, Inc. | HNU GC 311D Portable Gas Chromatograph | 3 |
| | | Solidification/ Stabilization | Gas Technology Institute | Cement-Lock Technology | 1 |
| | | | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | Gas Technology Institute | Cement-Lock Technology | 1 |
| | Organics | Chemical Treatment | Concurrent Technologies | Organics Destruction and Metals Stabilization | 2 |
| | | | Kvaerner Energy & Environment | Chemical Treatment | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Solidification/ Stabilization | Gas Technology Institute | Cement-Lock Technology | 1 |
| | | Thermal Destruction | Gas Technology Institute | Cement-Lock Technology | 1 |
| | PAHs | Physical/Chemical Treatment | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | Portable Gas Chromatograph | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | Spectrometer | SiteLAB Corporation | Ultraviolet Fluorescence Spectroscopy | 3 |
| | PCBs | Biological Degradation | ZENON Environmental Inc. | ZenoGem™ Process | 1 |
| | | Field Portable X-ray Fluorescence | Metorex, Inc. | Field Portable X-ray Fluorescence Analysis | 3 |
| | | Physical/Chemical Thermal Desorption | ELI Eco Logic International Inc. | Gas-Phase Chemical Reduction Process | 1 |
| Liquid (Cont) | PCBs (Cont) | Physical/Chemical Thermal Desorption (Cont) | KAI Technologies, Inc./Brown and Root Environmental | Radio Frequency Heating | 1 |
| | | | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | | SoilTech ATP Systems, Inc. | Anaerobic Thermal Processor | 1 |
| | | Physical/Chemical Treatment | Calgon Carbon Oxidation Technologies | perox-pure™ Chemical Oxidation Technology | 1 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Beam Irradiation | 1/2 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Beam Irradiation | 1/2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Matrix Photocatalytic Inc. | Photocatalytic Water Treatment | 1/2 |
| | | | Morrison Knudsen Corp./Spetstamponazh geologia Enterprises/STG Technologies | Clay-Base Grouting Technology | 1 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | | U.S. Filter/Zimpro Inc. | Ultraviolet Radiation and Oxidations | 1 |
| | | | U. of Wisconsin - Madison | Photoelectrocatalytic Degradation and Removal | 2 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | HNU Systems, Inc. | HNU GC 311D Portable Gas Chromatograph | 3 |
| | | | Sentex Sensing Technology, inc. | Scentograph Plus II Portable Gas Chromatograph | 3 |
| Liquid (Cont) | PCBs (Cont) | Portable Gas Chromatographs (Cont) | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | | U.S. EPA | Field Analytical Screening Program PCB Method | 3 |
| | | Solidification/ Stabilization | Gas Technology Institute | Cement-Lock Technology | 1 |
| | | | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Strategic Diagnostics, Inc. | PENTA RISc Test System | 3 |
| | | | Hanby Environmental Laboratory Procedures, Inc. | Test Kits for Organic Contaminants in Soil and Water | 3 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | Gas Technology Institute | Cement-Lock Technology | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | PCP | Physical/Chemical Treatment | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | | U.S. Filter/Zimpro Inc. | Ultraviolet Radiation and Oxidation | 1 |
| | | Test Kits | Strategic Diagnostics, Inc. | PENTA RISc Test System | 3 |
| | | | Strategic Diagnostics, Inc. | RaPID Assay® | 3 |
| | Pesticides | Biological Degradation | BioTrol, Inc. | Biological Aqueous Treatment System | 1 |
| | | | Electrokinetics, Inc. | In Situ Bioremediation by Electrokinetic Injections | 3 |
| | | | ZENON Environmental Inc. | ZenoGem™ Process | 1 |
| Liquid (Cont) | Pesticides (Cont) | Physical/Chemical Thermal Desorption | ELI Eco Logic International Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | | KAI Technologies, Inc./Brown and Root Environmental | Radio Frequency heating | 1 |
| | | | SoilTech ATP Systems, Inc. | Anaerobic Thermal Process | 1 |
| | | Physical/Chemical Treatment | Calgon Carbon Oxidation Technologies | perox-pure™ Chemical Oxidation Technology | 1 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | High Voltage Environmental Applications, Inc. | High-Energy Electron Beam Irradiation | 1/2 |
| | | | High Voltage Environmental Applications, Inc. | High-Energy Electron Irradiation | 1/2 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Water Treatment | 1/2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Morrison Knudsen Corp./Spetstamponazh geologia Enterprises/STG Technologies | Clay-Base Grouting Technology | 1 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | | U.S. Filter/Zimpro Inc. | Ultraviolet Radiation and Oxidation | 1 |
| | | | U. of Wisconsin - Madison | Photoelectrocatalytic Degradation and Removal | 2 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | Sentex Sensing Technology, Inc. | Scentograph Plus II Portable Gas Chromatograph | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| Liquid (Cont) | Pesticides (Cont) | Portable Gas Chromatographs (Cont) | U.S. EPA | Field Analytical Screening Program PCB Method | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Strategic Diagnostics, Inc. | PENTA RISc Test System | 3 |
| | | | Hanby Environmental Laboratory Procedure, Inc. | Test Kits for Organic Contaminants in Soil and Water | 3 |
| | | | Strategic Diagnostics, Inc. | RaPID Assay® | 3 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | Petroleum Hydrocarbons | Materials Handling | National Risk Management Research Laboratory, U. of Cincinnati, and FRX, Inc. | Hydraulic Fracturing | 1 |
| | | Physical/Chemical Thermal Desorption | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | Physical/Chemical Treatment | Calgon Carbon Oxidation Technologies | perox-pure™ Chemical Oxidation Technology | 1 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | Portable Gas Chromatographs | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | Spectrometers | Horiba Instruments, Inc. | Infrared Analysis | 3 |
| | | | SiteLAB Corporation | Ultraviolet Fluorescence Spectroscopy | 3 |
| Liquid (Cont) | Radionuclides | Physical/Chemical Radioactive Waste Treatment | Filter Flow Technology, Inc. | Heavy Metals and Radionuclide Polishing Filter | 1 |
| | | Physical/Chemical Treatment | Atomic Energy of Canada, Ltd. | Chemical Treatment and Ultrafiltration | 2 |
| | | | Selentec Environmental Technologies, Inc. | Selentec MAG*SEP Technology | 1 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | SVOCs | Biological Degradation | BioTrol, Inc. | Biological Aqueous Treatment System | 1 |
| | | | Harding ESE, a Mactec Co. | Two-Zone, Plume Interception, In Situ Treatment Technology | 1/2 |
| | | | New York State Dept. Of Environmental Conservation/R.E. Wright Environmental Inc. | In Situ Bioventing Treatment System | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | IT Corporation | Oxygen Microbubble In Situ Bioremediation | 2 |
| | | | ZENON Environmental Inc. | ZenoGem™ Process | 1 |
| | | Physical/Chemical Thermal Desorption | ELI Eco Logic International Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | | KAI Technologies, Inc./Brown and Root Environmental | Radio Frequency Heating | 1 |
| | | | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | | SoilTech ATP Systems, Inc. | Anaerobic Thermal Processor | 1 |
| | | | Western Research Institute | Contained Recovery of Oily Wastes (CROW™) | 2 |
| | | Physical/Chemical Treatment | ARS Technologies, Inc. | Pneumatic Fracturing Extraction™ and Catalytic Oxidation | 1 |
| Liquid (Cont) | SVOCs (Cont) | Physical/Chemical Treatment (Cont) | Calgon Carbon Oxidation Technologies | perox-pure™ Chemical Oxidation Technology | 1 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | High Voltage Environmental Applications, Inc. | High-Energy Electron Beam Irradiation | 1/2 |
| | | | High Voltage Environmental Applications, Inc. | High-Energy Electron Irradiation | 1/2 |
| | | | Pulse Sciences, Inc. | X-ray Treatment of Aqueous Solutions | 2 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | | Terra Vac, Inc. | In Situ and Ex Situ Vacuum Extraction | 1 |
| | | | U. of Wisconsin - Madison | Photoelectrocatalytic Degradation and Removal | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Roy F. Weston, Inc./IEG Technologies | UVB - Vacuum Vaporizing Well | 1 |
| | | | Xerox Corp. | 2-PHASE™ EXTRACTION Process | 1 |
| | | Portable Gas Chromatographs | Analytical and Remedial Technology, Inc. | Automated Sampling and Analytical Platform | 3 |
| | | | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | U.S. EPA | Field Analytical Screening Program PCB Method | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Strategic Diagnostics, Inc. | RaPID Assay® | 3 |
| Liquid (Cont) | SVOCs (Cont) | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | Texaco Inc. | Texaco Gasification process | 1 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | | Other | Berkeley Environmental Restoration Center | In Situ Steam Enhanced Extraction Process | 1 |
| | VOCs | Biological Degradation | ASC/EMR Wright-Patterson AFB | Phytoremediation of TCE-Contaminated Shallow Groundwater | 1 |
| | | | Billings and Associates, Inc. | Subsurface Volatilization and Ventilation System (SVVS®) | 1 |
| | | | Bio-Rem, Inc. | Augmented In Situ Subsurface Bioremediation Process | 1 |
| | | | BioTrol, Inc. | Biological Aqueous Treatment System | 1 |
| | | | Electrokinetics, Inc. | In Situ Bioremediation by Electrokinetic Injection | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | New York State Dept. of Environmental Conservation/R.E. Wright Environmental, Inc. | In Situ Bioventing Treatment System | 1 |
| | | | IT Corporation | Oxygen Microbubble In Situ Bioremediation | 2 |
| | | | ZENON Environmental Inc. | ZenoGem™ Process | 1 |
| | | Materials Handling | National Risk Management Research Laboratory, U. of Cincinnati, and FRX, Inc. | Hydraulic Fracturing | 1 |
| | | Physical/Chemical Thermal Desorption | Hughes Environmental Systems, Inc. | Steam Enhanced Recovery Process | 1 |
| Liquid (Cont) | VOCs (Cont) | Physical/Chemical Thermal Desorption (Cont) | KAI Technologies, Inc./Brown and Root Environmental | Radio Frequency Heating | 1 |
| | | | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | | Rochem Separation Systems, Inc. | Rochem Disc Tube™ Module System | 1 |
| | | | SoilTech ATP Systems, Inc. | Anaerobic Thermal Processor | 1 |
| | | | Western Research Institute | Contained Recovery of Oily Wastes (CROW™) | 2 |
| | | Physical/Chemical Treatment | ARS Technologies, Inc. | Pneumatic Fracturing Extraction™ and Catalytic Oxidation | 1 |
| | | | Arizona State U./ Zentox Corp. | Photocatalytic Oxidation with Air Stripping | 2 |
| | | | Calgon Carbon Oxidation Technologies | perox-pure™ Chemical Oxidation Technology | 1 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Radian International LLC | Integrated AquaDetox Steam Vacuum Stripping and Soil Vapor Extraction/Reinjection | 1 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Irradiation | 1/2 |
| | | | KSE, Inc. | Adsorption-Integrated-Reaction Process | 2 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Water Treatment | 1/2 |
| | | | Morrison Knudsen Corp./Spetstamponazh geologia Enterprises/STG Technologies | Clay-Base Grouting Technology | 1 |
| | | | Pulse Sciences, Inc. | X-ray Treatment of Aqueous Solutions | 2 |
| Liquid (Cont) | VOCs (Cont) | Physical/Chemical Treatment (Cont) | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | | Terra Vac, Inc. | In Situ and Ex Situ Vacuum Extraction | 1 |
| | | | U.S. Filter/Zimpro Inc. | Ultraviolet Radiation and Oxidation | 1 |
| | | | U. of Nebraska - Lincoln | Center Pivot Spray Irrigation System | 1 |
| | | | UV Technologies, Inc. | PhotoCAT™ Process | 2 |
| | | | Roy F. Weston, Inc. | Ambersorb® 563 Adsorbent | 2 |
| | | | Roy F. Weston, Inc./IEG Technologies | UVB - Vacuum Vaporizing Well | 1 |
| | | | Xerox Corp. | 2-PHASE™ EXTRACTION Process | 1 |
| | | | ZENON Environmental Inc. | Cross-Flow Pervaporation System | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | HNU Systems, Inc. | HNU GC 311D Portable Gas Chromatograph | 3 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Photovac Monitoring Instruments | PE Photovac Voyager Portable Gas Chromatograph | 3 |
| | | | Sentex Sensing Technology, Inc. | Scentograph Plus II Portable Gas Chromatograph | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | | U.S. EPA | Field Analytical Screening Program PCB Method | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Hanby Environmental Laboratory Procedure, Inc. | Test Kits for Organic Contaminants in Soil and Water | 3 |
| | | | Strategic Diagnostics, Inc. | RaPID Assay® | 3 |
| Liquid (Cont) | VOCs (Cont) | Thermal Destruction | Texaco Inc. | Texaco Gasification Process | 1 |
| | | Other | Berkeley Environmental Restoration Center | In Situ Steam Enhanced Extraction Process | 1 |
| | Other | Physical/Chemical Treatment | North American Technologies Group, Inc. | Oleophilic Amine-Coated Ceramic Chip | 1 |
| | | | RECRA Environmental, Inc. | Alternating Electrocoagulation Technology | 2 |
| Mine Tailings | Heavy Metals | Thermal Destruction | Terra Therm, Inc | In-Situ Thermal Destruction | 1 |
| | Metals | Materials Handling | U. of South Carolina | In Situ Mitigation of Acid Water | 2 |
| | Organics | Thermal Destruction | Terra Therm, Inc | In-Situ Thermal Destruction | 1 |
| | Radionuclides | Thermal Destruction | Terra Therm, Inc | In-Situ Thermal Destruction | 1 |
| Sediment | Aromatic VOCs | Biological Degradation | Bio-Rem Inc. | Augmented In Situ Subsurface Bioremediation Process | 1 |
| | | | Electrokinetics, Inc. | In Situ Bioremediation by Electrokinetic Injection | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Grace Bioremediation Technologies | DARAMEND™ Bioremediation Technology | 1 |
| | | | Gas Technology Institute | Fluid Extraction - Biological Degradation Process | 2 |
| | | | New York State Dept. Of Environmental Conservation/ENSR Consulting and Larsen Engineers | Ex Situ Biovault | 1 |
| | | | New York State Dept. Of Environmental Conservation/R.E. Wright Environmental, Inc. | In Situ Bioventing Treatment System | 1 |
| | | | IT Corporation | Oxygen Microbubble In Situ Bioremediation | 2 |
| Sediment (Cont) | Aromatic VOCs (Cont) | Materials Handling | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical Thermal Desorption | Biotherm, LLC | Carver-Greenfield Process® for Solvent Extraction of Wet, Oily Wastes | 1 |
| | | | Maxymillian Technologies, Inc. | Thermal Desorption System | 1 |
| | | | Novaterra Associates | In-Situ Soil Treatments (Steam/Air Stripping) | 1 |
| | | | Recycling Sciences International, Inc. | Desorption and Vapor Extraction System | 1 |
| | | | Roy F. Weston, Inc. | Low Temperature Thermal Treatment (LT$^{3®}$) System | 1 |
| | | Physical/Chemical Treatment | Bergmann, A Division of Linatex, Inc. | Soil and Sediment Washing | 1 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | Electrokinetics, Inc. | Electrokinetic Soil Processing | 1 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Beam Irradiation | 1/2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Irradiation | 1/2 |
| | | | Gas Technology Institute | Supercritical Extraction/Liquid Phase Oxidation | 2 |
| | | | Ionics/Resources Conservation Co. | B.E.S.T. Solvent Extraction Technology | 1 |
| | | | IT Corp. | Mixed Waste Treatment Process | 2 |
| | | | Terra Vac, Inc. | In Situ and Ex Situ Vacuum Extraction | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | U.S. EPA | Field Analytical Screening Program PCB Method | 3 |
| Sediment (Cont) | Aromatic VOCs (Cont) | Solidification/ Stabilization | Geo-Con, Inc. | In Situ Solidification and Stabilization Process | 1 |
| | | | WASTECH, Inc. | Solidification and Stabilization | 1 |
| | | | Western Product Recovery Group, Inc. | Coordinate, Chemical Bonding, and Adsorption Treatment | 2 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Thermal Destruction | Sonotech, Inc. | Frequency-Turnable Pulse Combustion System | 1 |
| | | | Texaco Inc. | Texaco Gasification Process | 1 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | | | Vortec Corp. | Oxidation and Vitrification Process | 1 |
| | Cyanide | Biological Degradation | Pintail Systems, Inc. | Spent Ore Bioremediation Process | 1 |
| | | Physical/Chemical Treatment | E & C Williams, Inc. | Calsium Sulfide and Calcium Polysulfide Technologies | 3 |
| | Diesel | Physical/Chemical Thermal Desorption | Integrated Water Resources, Inc. | Dynamic Underground Stripping of TCE | 1 |
| | Dioxins | Biological Degradation | BioTrol, Inc. | Soil Washing System | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Chemical Thermal Desorption | Biotherm, LLC | Biotherm Process™ | 1 |
| | | | Gas Technology Institute | Fluid Extraction - Biological Degradation Process | 2 |
| | | Materials Handling | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical Thermal Desorption | ELI Eco Logic International Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | | ELI Eco Logic International Inc. | Thermal Desorption Unit | 1 |
| | | | Recycling Sciences International, Inc. | Desorption and Vapor Extraction System | 1 |
| | | | Roy F. Weston, Inc. | Low Temperature Thermal Treatment (LT$^{3®}$) System | 1 |
| Sediment (Cont) | Dioxins (Cont) | Physical/Chemical Treatment | ART International, Inc. | Low-Energy Extraction Process (LEEP) | 2 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Irradiation | 1/2 |
| | | | Ionics/Resources Conservation Co. | B.E.S.T. Solvent Extraction Technology | 1 |
| | | | IT Corp. | Mixed Waste Treatment Process | 2 |
| | | | National Risk Management Research Laboratory and IT Corp. | Base-Catalyzed Decomposition Process | 1 |
| | | | National Risk Management Research Laboratory and IT Corp. | Debris Washing System | 1 |
| | | | Terra-Kleen Response Group | Solvent Extraction Treatment System | 1 |
| | | | Trinity Environmental Technologies, Inc. | PCB- and Organochlorine-Contaminated Soil Detoxification | 2 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Solidification/ Stabilization | Geosafe Corp. | In Situ Vitrification | 1 |
| | | | WASTECH, Inc. | Solidification and Stabilization | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Strategic Diagnostics, Inc. | RaPID Assay® | 3 |
| | | Thermal Desorption | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | Energy and Environmental Research Corp. | Reactor Filter system | 2 |
| Sediment (Cont) | Dioxins (Cont0 | Thermal Desorption (Cont) | Gas Technology Institute | Fluidized-Bed/Cyclonic Agglomerating Combustor | 2 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | | | Vortec Corp. | Oxidation and Vitrification Process | 1 |
| | | Thermal Destruction | Terra Therm, Inc. | In-Situ Thermal Destruction | 1 |
| | Explosives | Biological Degradation | U. of Idaho Research Foundation | The SABRE™ Process | 1 |
| | | Physical/Chemical Thermal Desorption | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | Furans | Biological Degradation | BioTrol, Inc. | Soil Washing System | 1 |
| | | | Gas Technology Institute | Fluid Extraction - Biological Degradation Process | 2 |
| | | Materials Handling | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical Thermal Desorption | ELI Eco Logic International Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | | ELI Eco Logic International Inc. | Thermal Desorption Unit | 1 |
| | | | Recycling Sciences International, Inc. | Desorption and Vapor Extraction System | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Roy F. Weston, Inc. | Low Temperature Thermal Treatment (LT$^{3®}$) System | 1 |
| | | Physical/Chemical Treatment | ART International, Inc. | Low-Energy Extraction Process (LEEP) | 2 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Irradiation | 1/2 |
| | | | Ionics/Resources Conservation Co. | B.E.S.T. Solvent Extraction Technology | 1 |
| Sediment (Cont) | Furans (Cont) | Physical/Chemical Treatment (Cont) | IT Corp. | Mixed Waste Treatment Process | 2 |
| | | | National Risk Management Research Laboratory and IT Corp. | Base-Catalyzed Decomposition Process | 1 |
| | | | National Risk Management Research Laboratory and IT Corp. | Debris Washing System | 1 |
| | | | Terra-Kleen Response Group | Solvent Extraction Treatment System | 1 |
| | | | Trinity Environmental Technologies, Inc. | PCB- and Organochlorine-Contaminated Soil Detoxification | 2 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | Solidification/ Stabilization | Geosafe Corp. | In Situ Vitrification | 1 |
| | | | WASTECH, Inc. | Solidification and Stabilization | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Strategic Diagnostics, Inc. | RaPID Assay® | 3 |
| | | Thermal Desorption | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | Energy and Environmental Research Corp. | Reactor Filter system | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Gas Technology Institute | Fluidized-Bed/Cyclonic Agglomerating Combustor | 2 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | | | Vortec Corp. | Oxidation and Vitrification Process | 1 |
| | Gasoline | Physical/Chemical Thermal Desorption | Integrated Water Resources Inc. | Dynamic Underground Stripping of TCE | 1 |
| | Halogenated VOCs | Biological Degradation | BioTrol, Inc. | Soil Washing System | 1 |
| Sediment (Cont) | Halogenated VOCs (Cont) | Biological Degradation (Cont) | Electrokinetics, Inc. | In Situ Bioremediation by Electrokinetic Injection | 2 |
| | | | Grace Bioremediation Technologies | DARAMEND™ Bioremediation Technology | 1 |
| | | | Gas Technology Institute | Fluid Extraction - Biological Degradation Process | 2 |
| | | | U. of Idaho Research Foundation | The SABRE™ Process | 1 |
| | | Materials Handling | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical Chemical Treatment - Biological Degradation | Pharmacia Corporation | Lasagna™ In Situ Soil Remediation | 1/2 |
| | | Physical/Chemical Thermal Desorption | ELI Eco Logic International Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | | ELI Eco Logic International Inc. | Thermal Desorption Unit | 1 |
| | | | Maxymillian Technologies, Inc. | Thermal Desorption System | 1 |
| | | | IT Corporation | X*TRAX™ Thermal Desorption | 1 |
| | | | Recycling Sciences International, Inc. | Desorption and Vapor Extraction System | 1 |
| | | | Smith Environmental Technologies Corp. | Low Temperature Thermal Aeration (LTTA®) | 1 |
| | | | Roy F. Weston, Inc. | Low Temperature Thermal Treatment (LT$^{3}$®) System | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Physical/Chemical Treatment | ART International, Inc. | Low-Energy Extraction Process (LEEP) | 2 |
| | | | Bergmann, A Division of Linatex, Inc. | Soil and Sediment Washing | 1 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Irradiation | 1/2 |
| Sediment (Cont) | Halogenated VOCs (Cont) | Physical/Chemical Treatment (Cont) | Ionics/Resources Conservation Co. | B.E.S.T. Solvent Extraction Technology | 1 |
| | | | IT Corp. | Mixed Waste Treatment Process | 2 |
| | | | National Risk Management Research Laboratory | Base-Catalyzed Decomposition Process | 1 |
| | | | National Risk Management Research Laboratory and IT Corp. | Debris Washing System | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | Solidification/ Stabilization | Chemfix Technologies, Inc. | Solidification and Stabilization | 1 |
| | | | WASTECH, Inc. | Solidification and Stabilization | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Strategic Diagnostics, Inc. | RaPID Assay® | 3 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | Retech, M4 Environmental Management, Inc. | Plasma Arc Vitrification | 1 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | | | Vortec Corp. | Oxidation and Vitrification Process | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| Sediment (Cont) | Heavy Metals | Physical/Chemical Treatment | Geokinetics International, Inc. | Electrokinetics for Lead Recovery | 1 |
| | | Solidification/ Stabilization | Institute of Gas Technology | Cement-Lock Technology | 1 |
| | | Thermal Destruction | Institute of Gas Technology | Cement-Lock Technology | 1 |
| | | | Institute of Gas Technology | Thermal Sediment Reuse Technology | 1 |
| | Inorganic | Physical/Chemical Treatment | Weiss Associates | Electro Chemical Remediation Technologies | 1 |
| | | Solidification/ Stabilization | Institute of Gas Technology | Cement-Lock Technology | 1 |
| | | Thermal Destruction | Gas Technology Institute | Cement-Lock Technology | 1 |
| | | | Gas Technology Institute | Thermal Sediment Reuse Technology | 1 |
| | Mercury | Physical/Chemical Treatment | Weiss Associates | Electro Chemical Remediation Technologies | 1 |
| | Metals | Biological Degradation | Geo-Microbial Technologies, Inc. | Metals Release and Removal from Wastes | 1 |
| | | | Edenspace, Inc. | Phytoremediation Technology | 1 |
| | | | Pintail Systems, Inc. | Biomineralization of Metals | 2 |
| | | | Pintail Systems, Inc. | Spent ore Bioremediation Process | 1 |
| | | Field Portable X-ray Fluorescence | NITON Corp. | XL Spectrum Analyzer | 3 |
| | | | Edax Portable Products Division Corp. | Metal Analysis Probe (MAP®) Portable Assayer | 3 |
| | | | Thermo Measure Tech | 9000 X-Ray Fluorescence Analyzer and Lead X-Ray Fluorescence Analyzer | 3 |
| | | Materials Handling | AEA Technology, PLC, National Environmental Technology Centre | Soil Separation and Washing Process | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Montana College of Mineral Science and Technology | Campbell Centrifugal Jig | 2 |
| | | | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| | | | U. of South Carolina | In Situ Mitigation of Acid Water | 2 |
| Sediment (Cont) | Metals (Cont) | Physical Chemical Treatment - Biological Degradation | Pharmacia Corporation | Lasagna™ In Situ Soil Remediation | 1/2 |
| | | Physical/Chemical Thermal Desorption | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | Physical/Chemical Treatment | Bergmann, A Division of Linatex, Inc. | Soil and Sediment Washing | 1 |
| | | | BioGenesis Enterprises, Inc. | BioGenesis™ Soil and Sediment Washing | 1 |
| | | | COGNIS, Inc. | Chemical Treatment | 1 |
| | | | Concurrent Technologies | Acid Extraction Treatment System | 2 |
| | | | Dynaphore, Inc. | FORAGER® Sponge | 1 |
| | | | Electrokinetics, Inc. | Electrokinetic Soil Processing | 1 |
| | | | E & C Williams, Inc. | Calsium Sulfide and Calcium Polysulfide Technologies | 3 |
| | | | Geokinetics International, Inc. | Electrokinetic Remediation Process | 1 |
| | | | General Atomics, Nuclear Remediation Technologies Div. | Acoustic Barrier Particulate Separator | 2 |
| | | | IT Corp. | Batch Steam Distillation and Metal Extraction | 2 |
| | | | IT Corp. | Chelation/Electrodeposition of Toxic Metals from Soils | 2 |
| | | | IT Corp. | Mixed Waste Treatment Process | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Lockheed Martin Missiles and Space Co. And Geokinetics International, Inc. | Electrokinetic Remediation Process | 1 |
| | | | National Risk Management Research Laboratory and IT Corp. | Debris Washing System | 1 |
| Sediment (Cont) | Metals (Cont) | Physical/Chemical Treatment (Cont) | Selentec Environmental Technologies, Inc. | Selentec MAG*SEP Technology | 1 |
| | | | Toronto Harbor Commission | Soil Recycling | 1 |
| | | Solidification/ Stabilization | Chemfix Technologies, Inc. | Solidification and Stabilization | 1 |
| | | | Ferro Corp. | Waste Vitrification Through Electric Melting | 2 |
| | | | EmTech Environmental Services | Dechlorination and Immobilization | 1 |
| | | | Geo-Con, Inc. | In Situ Solidification and Stabilization Process | 1 |
| | | | Geosafe Corp. | In Situ Vitrification | 1 |
| | | | Institute of Gas Technology | Cement-Lock Technology | 1 |
| | | | Sevenson Environmental Services, Inc. | MAECTITE® Chemical Treatment Process | 1 |
| | | | Soliditech, Inc. | Solidification and Stabilization | 1 |
| | | | SOLUCORP Industries | Molecular Bonding System | 1 |
| | | | STC Remediation, A Division of Omega Environmental, Inc. | Organic Stabilization and Chemical Fixation/ Solidification | 1 |
| | | | WASTECH, Inc. | Solidification and Stabilization | 1 |
| | | | Western Product Recovery Group, Inc. | Coordinate, Chemical Bonding, and Adsorption Treatment | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Wheelabrator Technologies Inc. | WES-PHix® Stabilization Process | 1 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | Energy and Environmental Research Corp. | Hybrid Fluidized Bed System | 2 |
| Sediment (Cont) | Metals (Cont) | Thermal Destruction (Cont) | Energy and Environmental Research Corp. | Reactor Filter System | 2 |
| | | | Gas Technology Institute | Cement-Lock Technology | 1 |
| | | | Gas Technology Institute | Fluidized-Bed/Cyclonic Agglomerating Combustor | 2 |
| | | | Horsehead Resource Development Co., Inc. | Flame Reactor | 1 |
| | | | Minergy Corp. | Glass Furnace Technology for Dredged Sediments | 1 |
| | | | Retech, M4 Environmental Management, Inc. | Plasma Arc Vitrification Combustor | 1 |
| | | | Vortec Corp. | Oxidation and Vitrification Process | 1 |
| | Organics | Physical/Chemical Treatment | Weiss Associates | Electro Chemical Remediation Technologies | 1 |
| | | Thermal Destruction | Gas Technology Institute | Thermal Sediment Reuse Technology | 1 |
| | | | Terra Therm, Inc. | In-Situ Thermal Destruction | 1 |
| | | Thermal Destruction | Gruppo Italimpresse | Infrared Thermal Destruction | 1 |
| | PAHs | Biological Degradation | Ecova Corp. | Bioslurry Reactor | 1 |
| | | | Gas Technology Institute | Fluid Extraction - Biological Degradation Process | 2 |
| | | | Remediation Technologies, Inc. | Liquid and Solids Biological Treatment | 1 |
| | | Chemical Thermal Desorption | Biotherm, LLC | Biothrem Process™ | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| Sediment (Cont) | | Physical/Chemical Thermal Desorption | Maxymillian Technologies, Inc. | Thermal Desorption and Vapor Extraction System | 1 |
| | | | Recycling Sciences International, Inc. | Desorption and Vapor Extraction System | 1 |
| | | Physical/Chemical Treatment | Bergmann, a Division of Linatex, Inc. | Soil and Sediment Washing | 1 |
| | PAHs (Cont) | Physical/Chemical Treatment (Cont) | BioGenesis Enterprises, Inc. | BioGenesis™ Soil and Sediment Washing Process | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | Thermal Destruction | Gas Technology Institute | Thermal Sediment Reuse Technology | 1 |
| | | | Terra Therm, Inc. | In-Situ Thermal Destruction | 1 |
| | PCBs | Biological Degradation | Gas Technology Institute | Chemical and Biological Treatment | 2 |
| | | | Gas Technology Institute | Fluid Extraction - Biological Degradation Process | 2 |
| | | | Integrated Water Resources, Inc. | Dynamic Underground Stripping of TCE | 1 |
| | | | Phytokinetics, Inc. | Phytoremediation Process | 1 |
| | | Chemical Thermal Desorption | Biotherm, LLC | Biothrem Process™ | 1 |
| | | Materials Handling | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical Thermal Desorption | Biotherm, LLC | Carver-Greenfield Process® for Solvent Extraction of Wet, Oily Wastes | 1 |
| | | | ELI Eco Logic International Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | | ELI Eco Logic International Inc. | Thermal Desorption Unit | 1 |
| | | | KAI Technologies, Inc./ Brown and Root Environmental | Radio Frequency Heating | 1 |
| | | | New Jersey Institute of Technology | GHEA Associates Process | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | IT Corporation | X*TRAX™ Thermal Desorption | 1 |
| | | | Recycling Sciences International, Inc. | Desorption and Vapor Extraction System | 1 |
| | | | Roy F. Weston, Inc. | Low Temperature Thermal Treatment (LT$^{3®}$) System | 1 |
| Sediment (Cont) | PCBs (Cont) | Physical/Chemical Treatment | ART International, Inc. | Low-Energy Extraction Process (LEEP) | 2 |
| | | | Bergmann, A Division of Linatex, Inc. | Soil and Sediment Washing | 1 |
| | | | BioGenesis Enterprises, Inc. | BioGenesis™ Soil and Sediment Washing Process | 1 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | Commodore Environmental Services, Inc. | Solvated Electron Remediation System | 1 |
| | | | General Atomics | Circulating Bed Combustor | 1 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Beam Irradiation | 1/2 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Irradiation | 1/2 |
| | | | Ionics/Resources Conservation Co. | B.E.S.T. Solvent Extraction Technology | 1 |
| | | | IT Corp. | Mixed Waste Treatment Process | 2 |
| | | | National Risk Management Research Laboratory | Base-Catalyzed Decomposition Process | 1 |
| | | | National Risk Management Research Laboratory and IT Corp. | Debris Washing System | 1 |
| | | | State U. of New York at Oswego, Environmental Research Center | Photocatalytic Degradation of PCB-Contaminated Sediments and Waters | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Terra-Kleen Response Group, Inc. | Solvent Extraction Treatment System | 1 |
| | | | Trinity Environmental Technologies, Inc. | PCB- and Organochlorine-Contaminated Soil Detoxification | 2 |
| Sediment (Cont) | PCBs (Cont) | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | U.S. EPA | Field Analytical Screening Program PCB Method | 3 |
| | | Solidification/ Stabilization | Chemfix Technologies, Inc. | Solidification and Stabilization | 1 |
| | | | EmTech Environmental Services | Dechlorination and Immobilization | 1 |
| | | | Gas Technology Institute | Cement-Lock Technology | 1 |
| | | | Geo-Con, Inc. | In Situ Solidification and Stabilization Process | 1 |
| | | | Geosafe Corp. | In Situ Vitrification | 1 |
| | | | Minergy | Thermal Sediment Reuse Technology | 1 |
| | | | Soliditech, Inc. | Solidification and Stabilization | 1 |
| | | | WASTECH, Inc. | Solidification and Stabilization | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Millipore Corporation | EnviroGard™ PCP Immunoassay Test Kit | 3 |
| | | | Strategic Diagnostics, Inc. | EnSys Penta Test System | 3 |
| | | | Strategic Diagnostics Inc. | EnviroGard(TM) PCB Immunoassay Test Kit | 3 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | Energy and Environmental Research Corp. | Hybrid Fluidized Bed System | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Gas Technology Institute | Cement-Lock Technology | 1 |
| Sediment (Cont) | PCBs (Cont) | Thermal Destruction (Cont) | Gas Technology Institute | Fluidized-Bed/Cyclonic Agglomerating Combustor | 2 |
| | | | Gas Technology Institute | Thermal Sediment Reuse Technology | 1 |
| | | | Minergy Corp. | Glass Furnace Technology for Dredged Sediments | 1 |
| | | | Retech, M4 Environmental Management, Inc. | Plasma Arc Vitrification | 1 |
| | | | Terra Therm, Inc. | In-Situ Thermal Destruction | 1 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | | | Vortec Corp. | Oxidation and Vitrification Process | 2 |
| | PCP | Biological Degradation | Remediation Technologies, Inc. | Liquid and Solids Biological Treatment | 1 |
| | | Physical/Chemical Thermal Desorption | Recycling Sciences International, Inc. | Desorption and Vapor Extraction System | 1 |
| | | Physical/Chemical Treatment | Trinity Environmental Technologies, Inc. | PCB- and Organochlorine-Contaminated Soil Detoxification | 2 |
| | | Test Kits | Strategic Diagnostics, Inc. | ENSYS Penta Test System | 3 |
| | | | Strategic Diagnostics, Inc. | RaPID Assay® | 3 |
| | Pesticides | Biological Degradation | BioTrol, Inc. | Soil Washing System | 1 |
| | | | Electrokinetics, Inc. | In Situ Bioremediation by Electrokinetic Injection | 2 |
| | | | Gas Technology Institute | Chemical and Biological Treatment | 2 |
| | | | Gas Technology Institute | Fluid Extraction - Biological Degradation Process | 2 |
| | | | Grace Bioremediation Technologies | DARAMEND™ Bioremediation Technology | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| Sediment (Cont) | Pesticides (Cont) | Biological Degradation (Cont) | Phytokinetics, Inc. | Phytoremediation Process | 1 |
| | | Materials Handling | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical Thermal Desorption | Biotherm, LLC | Carver-Greenfield Process® for Solvent Extraction of Wet, Oily Wastes | 1 |
| | | | ELI Eco Logic International Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | | ELI Eco Logic International Inc. | Thermal Desorption Unit | 1 |
| | | | KAI Technologies, Inc./ Brown and Root Environmental | Radio Frequency Heating | 1 |
| | | | IT Corporation | X*TRAX™ Thermal Desorption | 1 |
| | | | Recycling Sciences International, Inc. | Desorption and Vapor Extraction System | 1 |
| | | | Smith Environmental Technologies Corp. | Low Temperature Thermal Aeration (LTTA®) | 1 |
| | | | Roy F. Weston, Inc. | Low Temperature Thermal Treatment (LT$^{3}$®) System | 1 |
| | | Physical/Chemical Treatment | ART International, Inc. | Low-Energy Extraction Process (LEEP) | 2 |
| | | | Bergmann, A Division of Linatex, Inc. | Soil and Sediment Washing | 2 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | Commodore Environmental Services, Inc. | Solvated Electron Remediation System | 1 |
| | | | Electrokinetics, Inc. | Electrokinetic Soil Processing | 1 |
| | | | General Atomics | Circulating Bed Combustor | 1 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Beam Irradiation | 1/2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| Sediment (Cont) | Pesticides (Cont) | Physical/Chemical Treatment (Cont) | High Voltage Environmental Applications, Inc. | High Energy Electron Irradiation | 1/2 |
| | | | Ionics/Resources Conservation Co. | B.E.S.T. Solvent Extraction Technology | 1 |
| | | | IT Corp. | Mixed Waste Treatment Process | 2 |
| | | | National Risk Management Research Laboratory | Base-Catalyzed Decomposition Process | 1 |
| | | | National Risk Management Research Laboratory and IT Corp. | Debris Washing System | 1 |
| | | | State U. of New York at Oswego, Environmental Research Center | Photocatalytic Degradation of PCB-Contaminated Sediments and Waters | 2 |
| | | | Terra-Kleen Response Group, Inc. | Solvent Extraction Treatment System | 1 |
| | | | Trinity Environmental Technologies, Inc. | PCB- and Organochlorine-Contaminated Soil Detoxification | 2 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | U.S. EPA | Field Analytical Screening Program PCB Method | 2 |
| | | Solidification/ Stabilization | Chemfix Technologies, Inc. | Solidification and Stabilization | 1 |
| | | | EmTech Environmental Services | Dechlorination and Immobilization | 1 |
| | | | Geo-Con, Inc. | In Situ Solidification and Stabilization Process | 1 |
| | | | Geosafe Corp. | In Situ Vitrification | 1 |
| | | | Soliditech, Inc. | Solidification and Stabilization | 1 |
| | | | WASTECH, Inc. | Solidification and Stabilization | 1 |
| Sediment (Cont) | Pesticides (Cont) | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Test Kits | Strategic Diagnostics, Inc. | EnSys Penta Test System | 3 |
| | | | Strategic Diagnostics, Inc. | RaPID Assay® | 3 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | Energy and Environmental Research Corp. | Hybrid Fluidized Bed System | 2 |
| | | | Gas Technology Institute | Fluidized-Bed/Cyclonic Agglomerating Combustor | 2 |
| | | | Retech, M4 Environmental Management, Inc. | Plasma Arc Vitrification | 1 |
| | | | Terra Therm, Inc. | In-Situ Thermal Destruction | 1 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | | | Vortec Corp. | Oxidation and Vitrification Process | 1 |
| | Petroleum Hydrocarbons | Biological Degradation | Ecova Corp. | Bioslurry Reactor | 1 |
| | | | Remediation Technologies, Inc. | Liquid and Solids Biological Treatment | 1 |
| | | Physical/Chemical Thermal Desorption | New Jersey Institute of Technology | GHEA Association process | 2 |
| | | | Smith Environmental Technologies Corp. | Low Temperature Thermal Aeration (LTTA®) | 1 |
| | | Thermal Destruction | Terra Therm, Inc. | In-Situ Thermal Destruction | 1 |
| | | Solidification/ Stabilization | Soliditech, Inc. | Solidification and Stabilization | 1 |
| | Radionuclides | Materials Handling | Eberline Services | Segmented Gate System | 2 |
| | | Physical/Chemical Treatment | Bergmann, A Division of Linatex, Inc. | Soil and Sediment Washing | 1 |
| Sediment (Cont) | Radionuclides (Cont) | Physical/Chemical Treatment (Cont) | IT Corp. | Mixed Waste Treatment Process | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Selentec Environmental Technologies, Inc. | Selentec MAG*SEP Technology | 1 |
| | | Solidification/ Stabilization | Sevenson Environmental Services, Inc. | MAECTITE® Chemical Treatment Process | 1 |
| | | | WASTECH, Inc. | Solidification and Stabilization | 1 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | SVOCs | Biological Degradation | BioTrol, Inc. | Soil Washing System | 1 |
| | | | Ecova Corp. | Bioslurry Reactor | 1 |
| | | | Gas Technology Institute | Chemical and Biological Treatment | 2 |
| | | | Gas Technology Institute | Fluid Extraction - Biological Degradation Process | 2 |
| | | | Grace Bioremediation Technologies | DARAMEND™ Bioremediation Technology | 1 |
| | | | IT Corp. | Tekno Associates Bioslurry Reactor | 2 |
| | | | New York State Dept. Of Environmental Conservation/ENSR Consulting and Larsen Engineers | Ex Situ Biovault | 1 |
| | | | New York State Dept. Of Environmental Conservation/R.E. Wright Environmental, Inc. | In Situ Bioventing Treatment System | 1 |
| | | | IT Corporation | Oxygen Microbubble In Situ Bioremediation | 2 |
| | | | Remediation Technologies, Inc. | Liquid and Solids Biological Treatment | 1 |
| | | Materials Handling | U.S. EPA | Excavation Techniques and Foam Suppression methods | 1 |
| Sediment (Cont) | SVOCs (Cont) | Physical/Chemical Thermal Desorption | Biotherm, LLC | Carver-Greenfield Process® for Solvent Extraction of Wet, Oily Wastes | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | ELI Eco Logic International Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | | ELI Eco Logic International Inc. | Thermal Desorption Unit | 1 |
| | | | KAI Technologies, Inc./Brown and Root Environmental | Radio Frequency Heating | 1 |
| | | | Maxymillian Technologies, Inc. | Thermal Desorption System | 1 |
| | | | New Jersey Institute of Technology | GHEA Association process | 2 |
| | | | NOVATERRA Associates | In-Situ Soil Treatments (Steam/Air Stripping) | 1 |
| | | | IT Corporation | X*TRAX™ Thermal Desorption | 1 |
| | | | Recycling Sciences International, Inc. | Desorption and Vapor Extraction System | 1 |
| | | | Smith Environmental Technologies Corp. | Low Temperature Thermal Aeration (LTTA®) | 1 |
| | | | Roy F. Weston, Inc. | Low Temperature Thermal Treatment (LT$^{3}$®) System | 1 |
| | | Physical/Chemical Treatment | Bergmann, A Division of Linatex, Inc. | Soil and Sediment Washing | 1 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | Electrokinetics, Inc. | Electrokinetic Soil Processing | 1 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Beam Irradiation | 1/2 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Irradiation | 1/2 |
| | | | Ionics/Resources Conservation Co. | B.E.S.T. Solvent Extraction Technology | 1 |
| Sediment (Cont) | SVOCs (Cont) | Physical/Chemical Treatment (Cont) | IT Corp. | Mixed Waste Treatment Process | 2 |
| | | | National Risk Management Research Laboratory | Base-Catalyzed Decomposition Process | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | National Risk Management Research Laboratory and IT Corp. | Debris Washing System | 1 |
| | | | Terra-Kleen Response Group, Inc. | Solvent Extraction Treatment System | 1 |
| | | | Terra Vac, Inc. | In Situ and Ex Situ Vacuum Extraction | 1 |
| | | | Toronto Harbor Commission | Soil Recycling. | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | U.S. EPA | Field Analytical Screening Program PCB Method | 3 |
| | | Solidification/ Stabilization | Chemfix Technologies, Inc. | Solidification and Stabilization | 1 |
| | | | Geo-Con, Inc. | In Situ Solidification and Stabilization Process | 1 |
| | | | STC Remediation, a Division of Omega Environmental, Inc. | Organic Stabilization and Chemical Fixation/ Solidification | 1 |
| | | | WASTECH, Inc. | Solidification and Stabilization | 1 |
| | | | Western Product Recovery Group, Inc. | Coordinate, Chemical Bonding, and Adsorption Treatment | 2 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Strategic Diagnostics, Inc. | RaPID Assay® | 3 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | Gas Technology Institute | Fluidized-Bed/Cyclonic Agglomerating Combustor | 2 |
| Sediment (Cont) | SVOCs (Cont) | Thermal Destruction (Cont) | Sonotech, Inc. | Frequency-Tunable Pulse Combustion System | 1 |
| | | | Terra Therm, Inc. | In-Situ Thermal Destruction | 1 |
| | | | Texaco Inc. | Texaco Gasification Process | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | | | Vortec Corp. | Oxidation and Vitrification Process | 1 |
| | VOCs | Biological Degradation | Bio-Rem, Inc. | Augmented In Situ Subsurface Bioremediation Process | 1 |
| | | | Ecova Corp. | Bioslurry Reactor | 1 |
| | | | Electrokinetics, Inc. | In Situ Bioremediation by Electrokinetic Injection | 2 |
| | | | New York State Dept. Of Environmental Conservation/ENSR Consulting and Larsen Engineers | Ex Situ Biovault | 1 |
| | | | New York State Dept. Of Environmental Conservation/R.E. Wright Environmental, Inc. | In Situ Bioventing Treatment System | 1 |
| | | | IT Corporation | Oxygen Microbubble In Situ Bioremediation | 2 |
| | | | Phytokinetics, Inc. | Phytoremediation Process | 2 |
| | | Materials Handling | AEA Technology, PLC, National Environmental Technology Centre | Soil Separation and Washing Process | 2 |
| | | | U.S. EPA | Excavation Techniques and Foam Suppression methods | 1 |
| | | Physical/Chemical Thermal Desorption | Biotherm, LLC | Carver-Greenfield Process® for Solvent Extraction of Wet, Oily Wastes | 1 |
| | | | KAI Technologies, Inc./Brown and Root Environmental | Radio Frequency Heating | 1 |
| Sediment (Cont) | VOCs (Cont) | Physical/Chemical Thermal Desorption (Cont) | Maxymillian Technologies, Inc. | Thermal Desorption System | 1 |
| | | | New Jersey Institute of Technology | GHEA Association process | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | NOVATERRA Associates | In-Situ Soil Treatments (Steam/Air Stripping) | 1 |
| | | | Recycling Sciences International, Inc. | Desorption and Vapor Extraction System | 1 |
| | | | Smith Environmental Technologies Corp. | Low Temperature Thermal Aeration (LTTA®) | 1 |
| | | | Roy F. Weston, Inc. | Low Temperature Thermal Treatment (LT³®) System | 1 |
| | | Physical/Chemical Treatment | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Irradiation | 1/2 |
| | | | Gas Technology Institute | Supercritical Extraction/Liquid Phase Oxidation | 2 |
| | | | Ionics/Resources Conservation Co. | B.E.S.T. Solvent Extraction Technology | 1 |
| | | | IT Corp. | Batch Steam Distillation and Metal Extraction | 2 |
| | | | IT Corp. | Mixed Waste Treatment Process | 2 |
| | | | Terra-Kleen Response Group, Inc. | Solvent Extraction Treatment System | 1 |
| | | | Terra Vac, Inc. | In Situ and Ex Situ Vacuum Extraction | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | U.S. EPA | Field Analytical Screening Program PCB Method | 3 |
| | | Solidification/ Stabilization | Geo-Con, Inc. | In Situ Solidification and Stabilization Process | 1 |
| | | | WASTECH, Inc. | Solidification and Stabilization | 1 |
| Sediment (Cont) | VOCs (Cont) | Solidification/ Stabilization (Cont) | Western Product Recovery Group, Inc. | Coordinate, Chemical Bonding, and Adsorption Treatment | 2 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Test Kits | Strategic Diagnostics, Inc. | RaPID Assay® | 3 |
| | | Thermal Destruction | Energy and Environmental Research Corp. | Hybrid Fluidized Bed System | 2 |
| | | | Gas Technology Institute | Fluidized-Bed/Cyclonic Agglomerating Combustor | 2 |
| | | | Retech, M4 Environmental Management, Inc. | Plasma Arc Vitrification | 1 |
| | | | Sonotech, Inc. | Frequency-Tunable Pulse Combustion System | 1 |
| | | | Texaco Inc. | Texaco Gasification Process | 1 |
| | | | Vortec Corp. | Oxidation and Vitrification Process | 1 |
| | Other | Samplers | Aquatic Research Instruments | Sediment Core Sampler | 3 |
| | | Solidification/ Stabilization | STC Remediation, A Division of Omega Environmental, Inc. | Organic Stabilization and Chemical Fixation/Solidification | 1 |
| | | | U.S. EPA NRMRL | Alternative Cover Assessment Program | 1 |
| | Not Applicable | Sampler | Art`s Manufacturing and Supply | Sediment Core Sampler | 3 |
| Sludge | Aromatic VOCs | Biological Degradation | Bio-Rem, Inc. | Augmented In Situ Subsurface Bioremediation Process | 1 |
| | | | Electrokinetics, Inc. | In Situ Bioremediation By Electrokinetic Injection | 2 |
| | | | Grace Bioremediation Technologies | DARAMEND™ Bioremediation Technology | 1 |
| | | | Gas Technology Institute | Fluid Extraction - Biological Degradation Process | 2 |
| Sludge (Cont) | Aromatic VOCs (Cont) | Biological Degradation (Cont) | New York State of Dept. of Environmental Conservation/ENSR Consulting and Larsen Engineers | Ex Situ Biovault | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | New York State Dept. of Environmental Conservation/R.E. Wright Environmental, Inc. | In Situ Bioventing Treatment System | 1 |
| | | | IT Corp. | Oxygen Microbubble In Situ Bioremediation | 2 |
| | | Materials Handling | United States Environmental Protection Agency | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical Thermal Desorption | Biotherm, LLC | Biotherm Process™ | 1 |
| | | | Maxymillian Technologies, Inc. | Thermal Desorption System | 1 |
| | | | Novaterra Associates | In-Situ Soil Treatments (Steam/Air Stripping) | 1 |
| | | | Recycling Sciences International, Inc. | Desorption and Vapor Extraction System | 1 |
| | | | Smith Environmental Technologies Corp. | Low Temperature Thermal Aeration (LTTA®) | 1 |
| | | Physical/Chemical Treatment | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | Electrokinetics, Inc. | Electrokinetic Soil Processing | 1 |
| | | | High Voltage Environmental Applications, Inc. | High-Energy Electron Beam Irradiation | |
| | | | High Voltage Environmental Applications, Inc. | High-Energy Electron Irradiation | 1 |
| | | | Gas Technology Institute | Supercritical Extraction/Liquid Phase Oxidation | 2 |
| | | | Ionics RCC | B.E.S.T. Solvent Extraction Technology | 1 |
| Sludge (Cont) | Aromatic VOCs (Cont) | Physical/Chemical Treatment (Cont) | IT Corp. | Mixed Waste Treatment Process | 2 |
| | | | Terra Vac, Inc. | In Situ and Ex Situ Vacuum Extraction | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | United States Environmental Protection Agency | Field Analytical Screening Program - PCB Method | 3 |
| | | Solidification/ Stabilization | Geo-Con, Inc. | In Situ Solidification and Stabilization Process | 1 |
| | | | WASTECH, Inc. | Solidification/Stabilization | 1 |
| | | | Western Product Recovery Group, Inc. | Coordinate, Chemical Bonding, and Absorption Treatment | 2 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Thermal Destruction | Sonotech, Inc. | Frequency-Tunable Pulse Combustion System | 1 |
| | | | Texaco, Inc. | Texaco Gasification Process | 1 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | | | Vortec Corp. | Vitrification Process | 1 |
| | Cyanide | Biological Degradation | Pintail Systems, Inc. | Spent Ore Bioremediation Process | 1 |
| | Dioxins | Biological Degradation | Gas Technology Institute | Fluid Extraction - Biological Degradation Process | 2 |
| | | Chemical Thermal Desorption | Biotherm, LLC | Biotherm Process™ | 1 |
| | | Materials Handling | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical Thermal Desorption | ELI Eco Logic Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | | ELI Eco Logic International Inc. | Thermal Desorption Unit | 1 |
| | | | Recycling Sciences International, Inc. | Desorption and Vapor Extraction System | 1 |
| Sludge (Cont) | Dioxins (Cont) | Physical/Chemical Thermal Desorption (Cont) | Roy F. Weston, Inc. | Low Temperature Thermal Treatment (LT3®) Systems | 1 |
| | | Physical/Chemical Treatment | ART International, Inc. | Low-Energy Extraction Process (LEEP) | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | High Voltage Environmental Applications, Inc. | High-Energy Electron Irradiation | 1 |
| | | | Ionics RCC | B.E.S.T. Solvent Extraction Technology | 1 |
| | | | IT Corp. | Mixed Waste Treatment Process | 2 |
| | | | National Risk Management Research Laboratory | Base-Catalyzed Decomposition Process | 1 |
| | | | National Risk Management Research Laboratory | Debris Washing System | 1 |
| | | | Terra-Kleen Response Group, Inc. | Solvent Extraction Treatment System | 1 |
| | | | Trinity Environmental Technologies, Inc. | PCB- and Organochlorine-Contaminated Soil Detoxification | 2 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | Solidification/ Stabilization | Geosafe Corp. | GeoMelt Vitrification | 1 |
| | | | WASTECH, Inc. | Solidification/Stabilization | 1 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | Energy and Environmental Research Corp. | Reactor Filter System | 2 |
| | | | Gas Technology Institute | Fluidized-Bed/Cyclonic Agglomerating Combustor | 2 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| Sludge (Cont) | Dioxins (Cont) | Thermal Destruction (Cont) | Vortec Corp. | Vitrification Process | 1 |
| | Explosives | Biological Degradation | U. of Idaho Research Foundation | The SABRE™ Process | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Physical/Chemical Thermal Desorption | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | Solidification/ Stabilization | Retech, Inc. | Plasma Heat | 1 |
| | | Thermal Desorption | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | Energy and Environmental Research Corp. | Reactor Filter System | 2 |
| | | | Gas Technology Institute | Fluidized-Bed/Cyclonic Agglomerating Combustor | 2 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | | | Vortec Corp. | Vitrification Process | 1 |
| | Halogenated VOCs | Biological Degradation | Bio-Rem, Inc. | Augmented In Situ Subsurface Bioremediation Process | 1 |
| | | | New York State Dept. of Environmental Conservation/ENSR Consulting and Larsen Engineers | Ex Situ Biovault | 1 |
| | | | New York State Dept. of Environmental Conservation/R.E. Wright Environmental, Inc. | In Situ Bioventing Treatment System | 1 |
| | | | IT Corp. | Oxygen Microbubble In Situ Bioremediation | 2 |
| | | Materials Handling | United States Environmental Protection Agency | Excavation Techniques and Foam Suppression Methods | 1 |
| Sludge (Cont) | Halogenated VOCs (Cont) | Physical/Chemical Treatment - Biological Degradation | Lasagna™ Public-Private Partnership | Lasagna™ In Situ Soil Remediation | 1 |
| | | Physical/Chemical Thermal Desorption | KAI Technologies, Inc./Brown and Root Environmental | Radio Frequency Heating | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | | NOVATERRA Associates | In-Situ Soil Treatments (Steam/Air Stripping) | 1 |
| | | | IT Corporation | X*TRAX™ Thermal Desorption | 1 |
| | | | Recycling Sciences International, Inc. | Desorption and Vapor Extraction System | 1 |
| | | | Roy F. Weston, Inc. | Low Temperature Thermal Treatment (LT3®) System | 1 |
| | | Physical/Chemical Treatment | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | Commodore Environmental Services, Inc. | Solvated Electron Remediation System | 1 |
| | | | Electrokinetics, Inc. | Electrokinetic Soil Processing | 1 |
| | | | High Voltage Environmental Applications, Inc. | High-Energy Electron Beam Irradiation | 2 |
| | | | High Voltage Environmental Applications, Inc. | High-Energy Electron Irradiation | 1 |
| | | | Gas Technology Institute | Supercritical Extraction/Liquid Phase Oxidation | 2 |
| | | | Ionics RCC | B.E.S.T. Solvent Extraction Technology | 1 |
| | | | IT Corp. | Mixed Waste Treatment Process | 2 |
| | | | Terra Vac, Inc. | In Situ and Ex Situ Vacuum Extraction | 1 |
| Sludge (Cont) | Halogenated VOCs (Cont) | Physical/Chemical Treatment (Cont) | Trinity Environmental Technologies, Inc. | PCB- and Organochlorine-Contaminated Soil Detoxification | 2 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | United States Environmental Protection Agency | Field Analytical Screening Program - PCB Method | 3 |
| | | Solidification/ Stabilization | Geo-Con, Inc. | In Situ Solidification and Stabilization Process | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | WASTECH, Inc. | Solidification/Stabilization | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Thermal Destruction | Energy and Environmental Research Corp. | Hybrid Fluidized Bed System | 2 |
| | | | Texaco, Inc. | Texaco Gasification Process | 1 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | | | Vortec Corp. | Vitrification Process | 1 |
| | Heavy Metals | Field Portable X-Ray Fluorescence | HNU Systems, Inc. | HNU Source Excited Fluorescence Analyzer-Portable (SEFA-P) X-Ray Fluorescence Analyzer | 3 |
| | | Chemical Treatment | Concurrent Technologies | Organic Destruction and Metal Stabilization | 1 |
| | | Physical/Chemical Treatment | Active Environmental, Inc. | TechXtract® Decontamination Process | 1 |
| | | Solidification/ Stabilization | Gas Technology Institute | Cement-Lock Technology | 1 |
| | | Thermal Destruction | Gas Technology Institute | Cement-Lock Technology | 1 |
| | Heavy Minerals | Materials Handling | Montana College of Mineral Science and Technology | Campbell Centrifugal Jig | 2 |
| | | Solidification/ Stabilization | Retech, Inc. | Plasma Heat | 1 |
| Sludge (Cont) | Herbicides | Biological Degradation | Electrokinetics, Inc. | In Situ Bioremediation by Electrokinetic Injection | 2 |
| | | | Grace Bioremediation Technologies | DARAMEND™ Bioremediation Technology | 1 |
| | | | Gas Technology Institute | Fluid Extraction - Biological Degradation Process | 2 |
| | | | U. of Idaho Research Foundation | The SABRE™ Process | 1 |
| | | Materials Handling | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Physical Chemical Treatment - Biological Degradation | Lasagna™ Public - Private Partnership | Lasagna™ In Situ Soil Remediation | 1 |
| | | Physical/Chemical Thermal Desorption | ELI Eco Logic Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | | ELI Eco Logic Inc. | Thermal Desorption Unit | 1 |
| | | | Maxymillian Technologies, Inc. | Thermal Desorption System | 1 |
| | | | IT Corporation | X*TRAX™ Thermal Desorption | 1 |
| | | | Recycling Sciences International, Inc. | Desorption and Vapor Extraction System | 1 |
| | | | Smith Environmental Technologies Corp. | Low Temperature Thermal Aeration (LTTA3) | 1 |
| | | | Roy F. Weston, Inc. | Low Temperature Thermal Treatment (LT3®) | 1 |
| | | Physical/Chemical Treatment | ART International, Inc. | Low-Energy Extraction Process (LEEP) | 2 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SC) Technology | 1 |
| | | | High Voltage Environmental Applications, Inc. | High-Energy Electron Irradiation | 1 |
| | | | Ionics RCC | B.E.S.T. Solvent Extraction Technology | 1 |
| Sludge (Cont) | Herbicides (Cont) | Physical/Chemical Treatment (Cont) | IT Corp. | Mixed Waste Treatment Process | 2 |
| | | | National Risk Management Research Laboratory | Base-Catalyzed Decomposition Process | 1 |
| | | | National Risk Management Research Laboratory and IT Corp. | Debris Washing System | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Solidification/ Stabilization | Chemfix Technologies, Inc. | Solidification and Stabilization | 1 |
| | | | WASTECH, Inc. | Solidification and Stabilization | 1 |
| | | Test Kits | Strategic Diagnostics, Inc. Corp | RaPID Assay® | 3 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | | | Vortec Corp. | Vitrification Process | 1 |
| | Inorganics | Field Portable X-Ray Fluorescence | HNU Systems, Inc. | HNU Source Excited Fluorescence Analyzer-Portable (SEFA-P) | 3 |
| | | Solidification/ Stabilization | Gas Technology Institute | Cement-Lock Technology | 1 |
| | | | Retech, Inc. | Plasma Heat | 1 |
| | | Thermal Destruction | Gas Technology Institute | Cement-Lock Technology | 1 |
| | Mercury | Physical/Chemical Treatment | Active Environmental Inc. | TechXtract® Decontamination Process | 1 |
| | | | Geokinetics | Electrokinetics for NSFO Mobilization | 1 |
| | | Solidification/ Stabilization | Retech, Inc. | Plasma Heat | 1 |
| Sludge (Cont) | Metals | Biological Degradation | Geo-Microbial Technologies, Inc. | Metals Release & Removal from Waste | 2 |
| | | | Phytotech | Phytoremediation Technology | 1 |
| | | | Pintail Systems, Inc. | Biomineralization of Metals | 2 |
| | | | Pintail Systems, Inc. | Spent Ore Bioremediation Process | 1 |
| | | Field Portable X-Ray Fluorescence | HNU Systems, Inc. | HNU Source Excited Fluorescence Analyzer-Portable (SEFA-P) X-Ray Fluorescence Analyzer | 3 |
| | | | NITON Corp. | XL Spectrum Analyzer | 3 |
| | | | TN Spectrace | 9000 X-Ray Fluorescence Analyzer and Lead X-Ray Fluorescence Analyzer | 3 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Materials Handling | AEA Technology Environment | Soil Separation and Washing Process | 2 |
| | | | Montana College of Mineral Science and Technology | Campbell Centrifugal Jig | 2 |
| | | | United States Environmental Protection Agency | Excavation Techniques and Foam Suppression Methods | 1 |
| | | | U. of South Carolina | In Situ Mitigation of Acid Water | 2 |
| | | Physical Chemical Treatment - Biological Degradation | Lasagna™ Public-Private Partnership | Lasagna™ In Situ Soil Remediation | 1 |
| | | Physical/Chemical Thermal Desorption | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | Physical/Chemical Treatment | BioGenesis Enterprises, Inc. | BioGenesis℠ Soil & Sediment Washing Process | 1 |
| | | | Center for Hazardous Materials Research | Acid Extraction Treatment System | 2 |
| | | | COGNIS, Inc. | TERRAMET Soil Remediation System | 1 |
| | | | Dynaphore, Inc. | FORAGER® Sponge | 1 |
| Sludge (Cont) | Metals (Cont) | Physical/Chemical Treatment (Cont) | Electrokinetics, Inc. | Electrokinetic Soil Processing | 1 |
| | | | General Atomics, Nuclear Remediation Technologies Division | Acoustic Barrier Particulate Separator | 2 |
| | | | IT Corp. | Batch Steam Distillation and Metal Extraction | 2 |
| | | | IT Corp. | Chelation/Electrodeposition of Toxic Metals from Soils | 2 |
| | | | IT Corp. | Mixed Waste Treatment Process | 2 |
| | | | National Risk Management Research Laboratory and IT Corp. | Debris Washing System | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Selentec Environmental Technologies, Inc. | Selentec MAG*SEP Technology | 1 |
| | | | Toronto Harbor Commission | Soil Recycling | 1 |
| | | Solidification/ Stabilization | Chemfix Technologies, Inc. | Solidification and Stabilization | 1 |
| | | | Ferro Corp. | Waste Vitrification through Electric Melting | 2 |
| | | | Funderburk & Associates | Dechlorination and Immobilization | 1 |
| | | | Geo-Con, Inc. | In Situ Solidification and Stabilization Process | 1 |
| | | | Gas Technology Institute | Cement-Lock Technology | 1 |
| | | | Geosafe Corp. | GeoMelt Vitrification | 1 |
| | | | Metso Minerals Industries, Inc. | Pyrkiln Thermal Encapsulation Process | 2 |
| | | | Rocky Mountain Remediation Services, LLC | Envirobond Solution | 1 |
| Sludge (Cont) | Metals (Cont) | Solidification/ Stabilization (Cont) | Sevenson Environmental Services, Inc. | MAECTITE® Chemical Treatment Process | 1 |
| | | | Soliditech, Inc. | Solidification and Stabilization | 1 |
| | | | Star Organics, LLC | Soil Rescue Remediation Fluid | 1 |
| | | | STC Remediation, A Division of Omega Environmental, Inc. | Organic Stabilization and Chemical Fixation/ Solidification | 1 |
| | | | WASTECH, Inc. | Solidification and Stabilization | 1 |
| | | | Western Product Recovery Group, Inc. | Coordinate, Chemical Bonding, and Absorption Treatment | 2 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | Energy and Environmental Research Corp. | Hybrid Fluidized Bed System | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Energy and Environmental Research Corp. | Reactor Filter System | 2 |
| | | | Gas Technology Institute | Cement-Lock Technology | 1 |
| | | | Gas Technology Institute | Fluidized-Bed/Cyclonic Agglomerating Combustor | 2 |
| | | | Horsehead Resource Development Co., Inc. | Flame Reactor | 1 |
| | | | PSI Technologies, A Division of Physical Sciences Inc. | Metals Immobilization and Decontamination of Aggregate Solids | 2 |
| | | | Vortec Corp. | Vitrification Process | 1 |
| | Organics | Chemical Treatment | Concurrent Technologies | Organic Destruction & Metals Stabilization | 2 |
| | | Physical/Chemical Treatment | Geokintetics | Electrokinetics for NSFO Mobilization | 1 |
| | | Solidification/ Stabilization | Gas Technology Institute | Cement-Lock Technology | 1 |
| Sludge (Cont) | Organics (Cont0 | Solidification/ Stabilization (Cont) | Retech, Inc. | Plasma Heat | 1 |
| | | Thermal Destruction | Gas Technology Institute | Cement-Lock Technology | 1 |
| | PAHs | Biological Degradation | Ecova Corp. | Bioslurry Reactor | 1 |
| | | | Gas Technology Institute | Fluid Extraction - Biological Degradation process | 2 |
| | | | Remediation Technologies, Inc. | Liquid and Solids Biological Treatment | 1 |
| | | Chemical Treatment Desorption | Biotherm, LLC | Biotherm Process™ | 1 |
| | | Physical/Chemical Thermal Desorption | Maxymillian Technologies, Inc. | Thermal Desorption System | 1 |
| | | | Recycling Sciences International, Inc. | Desorption and Vapor Extraction System | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Physical/Chemical Treatment | BioGenesis Enterprises, Inc. | BioGenesis℠ Soil & Sediment Washing Process | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | PCBs | Biological Degradation | Gas Technology Institute | Chemical and Biological Treatment | 2 |
| | | | Gas Technology Institute | Fluid Extraction - Biological Degradation Process | 2 |
| | | Chemical Thermal Desorption | Biotherm, LLC | Biotherm Process™ | 1 |
| | | Materials Handling | United States Environmental Protection Agency | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical Thermal Desorption | Biotherm, LLC | Biotherm Process™ | 1 |
| | | | ELI Eco Logic Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | | ELI Eco Logic, Inc. | Thermal Desorption Unit | 1 |
| Sludge (Cont) | PCBs (Cont) | Physical/Chemical Thermal Desorption (Cont) | KAI Technologies, Inc./Brown and Root Environmental | Radio Frequency Heating | 1 |
| | | | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | | IT Corporation Remediation Services Corp. | X*TRAX™ Thermal Desorption | 1 |
| | | | Recycling Sciences International, Inc. | Desorption and Vapor Extraction System | 1 |
| | | | Roy F. Weston, Inc. | Low Temperature Thermal Treatment (LT3®) System | 1 |
| | | Physical/Chemical Treatment | ART International, Inc. | Low-Energy Extraction Process (LEEP) | 2 |
| | | | BioGenesis Enterprises, Inc. | BioGenesis℠ Soil & Sediment Washing Process | 1 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Commodore Environmental Service, Inc. | Solvated Electron Remediation System | 1 |
| | | | General Atomics | Circulating Bed Combustor | 1 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Beam Irradiation | 2 |
| | | | High Voltage Environmental Applications, Inc. | High-Energy Electron Irradiation | 1 |
| | | | Ionics RCC | B.E.S.T. Solvent Extraction Technology | 1 |
| | | | IT Corp. | Mixed Waste Treatment Process | 2 |
| | | | National Risk Management Research Laboratory | Base-Catalyzed Decomposition Process | 1 |
| Sludge (Cont) | PCBs (Cont) | Physical/Chemical Treatment (Cont) | National Risk Management Research Laboratory and IT Corp. | Debris Washing System | 1 |
| | | | State U. of New York at Oswego, Environmental Research Center | Electrochemical Peroxidation of PCB-Contaminated Sediments and Waters | 2 |
| | | | Terra-Kleen Response Group, Inc. | Solvent Extraction Treatment System | 1 |
| | | | Trinity Environmental Technologies, Inc. | PCB- and Organochlorine-Contaminated Soil Detoxification | 2 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | United States Environmental Protection Agency | Field Analytical Screening Program - PCB Method | 3 |
| | | Solidification/ Stabilization | Chemfix Technologies, Inc. | Solidification and Stabilization | 1 |
| | | | Funderburk & Associates | Dechlorination and Immobilization | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Gas Technology Institute | Cement-Lock Technology | 1 |
| | | | Geo-Con Inc. | In Situ Solidification and Stabilization Process | 1 |
| | | | Geosafe Corp. | GeoMelt Vitrification | 1 |
| | | | Soliditech, Inc. | Solidification and Stabilization | 1 |
| | | | WASTECH, Inc. | Solidification and Stabilization | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Strategic Diagnostics, Inc. | Ensys Penta Test System | 3 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| Sludge (Cont) | PCBs (Cont) | Thermal Destruction (Cont) | Energy and Environmental Research Corp. | Hybrid Fluidized Bed System | 2 |
| | | | Gas Technology Institute | Cement Lock Technology | 1 |
| | | | Gas Technology Institute | Fluidized-Bed/Cyclonic Agglomerating Combustor | 2 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | | | Vortec Corp. | Vitrification Process | 1 |
| | PCP | Biological Degradation | Remediation Technology, Inc. | Liquid and Solids Biological Treatment | 1 |
| | | Physical/Chemical Thermal Desorption | Recycling Sciences International Inc. | Desorption and Vapor Extraction System | 1 |
| | | Physical/Chemical Treatment | Trinity Environmental Technologies, Inc. | PCB- and Organochlorine-Contaminated Soil Detoxification | 2 |
| | | Test Kits | Strategic Diagnostics, Inc. | Ensys Penta Test System | 3 |
| | | | Strategic Diagnostics, Inc. | RaPID Assay® | 3 |
| | Pesticides | Biological Degradation | Electrokinetics, Inc. | In Situ Bioremediation By Electrokinetic Injection | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Gas Technology Institute | Chemical and Biological Treatment | 2 |
| | | | Gas Technology Institute | Fluid Extraction - Biological Degradation Process | 2 |
| | | | Grace Bioremediation Technologies | DARAMEND™ Bioremediation Technology | 1 |
| | | Materials Handling | United States Environmental Protection Agency | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical Thermal Desorption | Biotherm, LLC | Biotherm Process™ | 1 |
| Sludge (Cont) | Pesticides (Cont) | Physical/Chemical Thermal Desorption (Cont) | ELI Eco Logic Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | | ELI Eco Logic Inc. | Thermal Desorption Unit | 1 |
| | | | KAI Technologies, Inc./Brown and Root Environmental | Radio Frequency Heating | 1 |
| | | | IT Corporation | X*TRAX™ Thermal Desorption | 1 |
| | | | Recycling Sciences International, Inc. | Desorption and Vapor Extraction System | 1 |
| | | | Smith Environmental Technologies Corp. | Low Temperature Thermal Aeration (LTTA®) | 1 |
| | | | Roy F. Weston, Inc. | Low Temperature Thermal Treatment (LT3®) System | 1 |
| | | Physical/Chemical Treatment | ART International, Inc. | Low-Energy Extraction Process (LEEP) | 2 |
| | | | CF Systems Corp. | Liquefied Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | Commodore Environmental Services, Inc. | Solvated Electron Remediation System | 1 |
| | | | Electrokinetics, Inc. | Electrokinetic Soil Processing | 1 |
| | | | General Atomics | Circulating Bed Combustor | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Beam Irradiation | 2 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Irradiation | 1 |
| | | | Ionics RCC | B.E.S.T. Solvent Extraction Technology | 1 |
| | | | IT Corp. | Mixed Waste Treatment Process | 2 |
| | | | National Risk Management Research Laboratory | Base-Catalyzed Decomposition Process | 1 |
| Sludge (Cont) | Pesticides (Cont) | Physical/Chemical Treatment (Cont) | National Risk Management Research Laboratory and IT Corp. | Debris Washing System | 1 |
| | | | State U. of New York at Oswego, Environmental Research Center | Electrochemical Peroxidation of PCB-Contaminated Sediments and Waters | 2 |
| | | | Terra-Kleen Response Group, Inc. | Solvent Extraction Treatment System | 1 |
| | | | Trinity Environmental Technologies, Inc. | PCB- and Organochlorine-Contaminated Soil Detoxification | 2 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | United States Environmental Protection Agency | Field Analytical Screening Program - PCB Method | 3 |
| | | Solidification/ Stabilization | Chemfix Technologies, Inc. | Solidification and Stabilization | 1 |
| | | | Funderburk & Associates | Dechlorination and Immobilization | 1 |
| | | | Geo-Con, Inc. | In Situ Solidification and Stabilization Process | 1 |
| | | | Geosafe Corp. | GeoMelt Vitrification | 1 |
| | | | Soliditech, Inc. | Solidification and Stabilization | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | WASTECH, Inc. | Solidification and Stabilization | 1 |
| | | Spectrometers | Graseby Ionics, Ltd. and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Strategic Diagnostics, Inc. | Ensys Penta Test System | 3 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | Energy and Environmental Research Corp. | Hybrid Fluidized Bed System | 2 |
| Sludge (Cont) | Pesticides (Cont) | Thermal Destruction (Cont) | Gas Technology Institute | Fluidized-Bed/Cyclonic Agglomerating Combustor | 2 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | | | Vortec Corp. | Vitrification Process | 1 |
| | PCP | Biological Degradation | Remediation Technologies, Inc. | Liquid and Solids Biological Treatment | 1 |
| | | Physical/Chemical Thermal Desorption | Recycling Sciences International Inc. | Desorption and Vapor Extraction System | 1 |
| | | Physical/Chemical Treatment | Trinity Environmental Technologies, Inc. | PCB- and Organochlorine-Contaminated Soil Detoxification | 2 |
| | | Test Kits | Strategic Diagnostics, Inc. | Ensys Penta Test System | 3 |
| | | | Strategic Diagnostics, Inc. Corp. | RaPID Assay® | 3 |
| | Pesticides | Biological Degradation | Electrokinetics, Inc. | In Situ Bioremediation By Electrokinetic Injection | 2 |
| | | | Gas Technology Institute | Chemical and Biological Treatment | 2 |
| | | | Gas Technology Institute | Fluid Extraction - Biological Degradation Process | 2 |
| | | | Grace Bioremediation Technologies | DARAMEND™ Bioremediation Technology | 1 |
| | | Materials Handling | United States Environmental Protection Agency | Excavation Techniques and Foam Suppression Methods | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Physical/Chemical Thermal Desorption | Biotherm, LLC | Biotherm Process™ | 1 |
| | | | ELI Eco Logic Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | | ELI Eco Logic, Inc. Inc. | Thermal Desorption Unit | 1 |
| | | | KAI Technology, Inc./Brown and Root Environmental | Radio Frequency Heating | 1 |
| Sludge (Cont) | Pesticides (Cont) | Physical/Chemical Thermal Desorption (Cont) | IT Corporation | X*TRAX™ Thermal Desorption | 1 |
| | | | Recycling Sciences International, Inc. | Desorption and Vapor Extraction System | 1 |
| | | | Smith Environmental Technologies Corp. | Low Temperature Thermal Aeration (LTTA®) | 1 |
| | | | Roy F. Weston, Inc. | Low Temperature Thermal Treatment (LT3®) System | 1 |
| | | Physical/Chemical Treatment | ART International, Inc. | Low-Energy Extraction Process (LEEP) | 2 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | Commodore Environmental Services, Inc. | Solvated Electron Remediation System | 1 |
| | | | Electrokinetics, Inc. | Electrokinetic Soil Processing | 1 |
| | | | General Atomics | Circulating Bed Combustor | 1 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Beam Irradiation | 2 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Irradiation | 1 |
| | | | Ionics RCC | B.E.S.T. Solvent Extraction Technology | 1 |
| | | | IT Corp. | Mixed Waste Treatment Process | 2 |
| | | | National Risk Management Research Laboratory | Base-Catalyzed Decomposition Process | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | National Risk Management Research Laboratory and IT Corp. | Debris Washing System | 1 |
| | | | State U. of New York at Oswego, Environmental Research Center | Electrochemical Peroxidation of PCB-Contaminated Sediments and Waters | 2 |
| Sludge (Cont) | Pesticides (Cont) | Physical/Chemical Treatment (Cont) | Terra-Kleen Response Group, Inc. | Solvent Extraction Treatment System | 1 |
| | | | Trinity Environmental Technologies, Inc. | PCB- and Organochlorine-Contaminated Soil Detoxification | 2 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | United States Environmental Protection Agency | Field Analytical Screening Program - PCB Method | 3 |
| | | Solidification/ Stabilization | Chemfix Technologies, Inc. | Solidification and Stabilization | 1 |
| | | | Funderburk & Associates | Dechlorination and Immobilization | 1 |
| | | | Geo-Con Inc. | In Situ Solidification and Stabilization Process | 1 |
| | | | Geosafe Corp. | GeoMelt Vitrification | 1 |
| | | | Soliditech, Inc. | Solidification and Stabilization | 1 |
| | | | WASTECH, Inc. | Solidification and Stabilization | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Strategic Diagnostics, Inc. | Ensys Penta Test System | 3 |
| | | | Strategic Diagnostics, Inc. Corp. | RaPID Assay® | 3 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | Energy & Environmental Research Corp. | Hybrid Fluidized Bed System | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Gas Technology Institute | Fluidized-Bed/Cyclonic Agglomerating Combustor | 2 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | | | Vortec Corp. | Vitrification Process | 1 |
| Sludge (Cont) | Petroleum Hydrocarbons | Biological Degradation | Ecova Corp. | Bioslurry Reactor | 1 |
| | | | Remediation Technologies, Inc. | Liquid and Solids Biological Treatment | 1 |
| | | Physical/Chemical Thermal Desorption | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | | Smith Environmental Technologies Corp. | Low Temperature Thermal Aeration (LTTA®) | 1 |
| | | Solidification/ Stabilization | Soliditech, Inc. | Solidification and Stabilization | 1 |
| | Radio Nuclides | Materials Handling | Thermo Nutech, Inc. | Segmented Gate System | 2 |
| | | Physical/Chemical Treatment | Active Environmental Technologies, Inc. | Tech Xtract® Decontamination Process | 1 |
| | | | IT Corp. | Mixed Waste Treatment Process | 2 |
| | | | Selentec Environmental Technologies, Inc. | Selentec MAG*SEP Technology | 1 |
| | | Solidification/ Stabilization | Sevenson Environmental Services, Inc. | MAECTITE® Chemical Treatment Process | 1 |
| | | | WASTECH, Inc. | Solidification and Stabilization | 1 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | SVOCs | Biological Degradation | Ecova Corp. | Bioslurry Reactor | 1 |
| | | | Gas Technology Institute | Chemical and Biological Treatment | 2 |
| | | | Gas Technology Institute | Fluid Extraction - Biological Degradation Process | 2 |
| | | | Grace Bioremediation Technologies | DARAMEND™ Bioremediation Technology | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | IT Corp. | Tekno Associates Bioslurry Reactor | 2 |
| Sludge (Cont) | SVOCs (Cont) | Biological Degradation (Cont) | New York State Dept. of Environmental Conservation/ENSR Consulting and Larsen Engineers | Ex Situ Biovault | 1 |
| | | | New York State Dept. of Environmental Conservation/R.E. Wright Environmental, Inc. | In Situ Bioventing Treatment System | 1 |
| | | | IT Corp. | Oxygen Microbubble In Situ Bioremediation | 2 |
| | | | Remediation Technologies, Inc. | Liquid and Solids Biological Treatment | 1 |
| | | Materials Handling | Untied States Environmental Protection Agency | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical Thermal Desorption | Biotherm, LLC | Biotherm Process™ | 1 |
| | | | ELI Eco Logic Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | | ELI Eco Logic, Inc. | Thermal Desorption Unit | 1 |
| | | | KAI Technologies, Inc./Brown and Root Environmental | Radio Frequency Heating | 1 |
| | | | Maxymillian Technologies, Inc. | Thermal Desorption System | 1 |
| | | | New Jersey Institute of Technology | GHEA Associates Process | 1 |
| | | | NOVATERRA Associates | In Situ Soil Treatments (Stream/Air Stripping) | 1 |
| | | | IT Corporation | X*TRAX™ Thermal Desorption | 1 |
| | | | Recycling Sciences International, Inc. | Desorption and Vapor Extraction System | 1 |
| | | | Smith Environmental Technologies Corp. | Low Temperature Thermal Aeration (LTTA®) | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| Sludge (Cont) | SVOCs (Cont) | Physical/Chemical Thermal Desorption (Cont) | Roy F. Weston, Inc. | Low Temperature Thermal Treatment (LT3®) System | 1 |
| | | Physical/Chemical Treatment | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | Electrokinetics, Inc. | Electrokinetic Soil Processing | 1 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Beam Irradiation | 2 |
| | | | High Voltage Environmental Applications, Inc. | High-Energy Electron Irradiation | 1 |
| | | | Ionics RCC | B.E.S.T. Solvent Extraction Technology | 1 |
| | | | IT Corp. | Mixed Waste Treatment Process | 2 |
| | | | National Risk Management Research Laboratory | Base-Catalyzed Decomposition Process | 1 |
| | | | National Risk Management Research Laboratory and IT Corp. | Debris Washing System | 1 |
| | | | Terra-Kleen Response Group, Inc. | Solvent Extraction Treatment System | 1 |
| | | | Terra Vac, Inc. | In Situ and Ex Situ Vacuum Extraction | 1 |
| | | | Toronto Harbor Commission | Soil Recycling | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | United States Environmental Protection Agency | Field Analytical Screening Program - PCB Method | 3 |
| | | Solidification/ Stabilization | Chemfix Technologies, Inc. | Solidification and Stabilization | 1 |
| | | | Geo-Con, Inc. | In Situ Solidification and Stabilization Process | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| Sludge (Cont) | SVOCs (Cont) | Solidification/ Stabilization (Cont) | STC Remediation, a Division of Omega Environmental, Inc. | Organic Stabilization and Chemical Fixation/Solidification | 1 |
| | | | WASTECH, Inc. | Solidification and Stabilization | 1 |
| | | | Western Product Recovery Group, Inc. | Coordinate, Chemical Bonding, and Absorption Treatment | 2 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Strategic Diagnostics, Inc. Corp. | RaPID Assay® | 3 |
| | | Thermal Desorption | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | Gas Technology Institute | Fluidized-Bed/Cyclonic Agglomerating Combustor | 2 |
| | | | Sonotech, Inc. | Frequency-Tunable Pulse Combustion System | 1 |
| | | | Texaco, Inc. | Texaco Gasification Process | 1 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | | | Vortec Corp. | Vitrification Process | 1 |
| | VOCs | Biological Degradation | Bio-Rem, Inc. | Augmented In Situ Subsurface Bioremediation Process | 1 |
| | | | Ecova Corp. | Bioslurry Reactor | 1 |
| | | | Electrokinetics, Inc. | In Situ Bioremediation by Electrokinetic Injection | 2 |
| | | | New York State Dept. of Environmental Conservation/ENSR Consulting and Larsen Engineering | Ex Situ Biovault | 1 |
| | | | New York State Dept. of Environmental Conservation/R.E. Wright Environmental, Inc. | In Situ Bioventing Treatment System | 1 |
| Sludge (Cont) | VOCs (Cont) | Biological Degradation (Cont) | IT Corp. | Oxygen Microbubble In Situ Bioremediation | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Materials Handling | AEA Technology Environment | Soil Separation and Washing Process | 2 |
| | | | United States Environmental Protection Agency | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical Thermal Desorption | Biotherm, LLC | Biotherm Process™ | 1 |
| | | | KAI Technologies, Inc./Brown and Root Environmental | Radio Frequency Heating | 1 |
| | | | Maxymillian Technologies, Inc. | Thermal Desorption System | 1 |
| | | | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | | NOVATERRA Associates | In-Situ Soil Treatments (Steam/Air Stripping) | 1 |
| | | | Recycling Sciences International, Inc. | Desorption and Vapor Extraction System | 1 |
| | | | Smith Environmental Technologies Corp. | Low Temperature Thermal Aeration (LTTA®) | 1 |
| | | | Roy F. Weston, Inc. | Low Temperature Thermal Treatment (LT3®) System | 1 |
| | | Physical/Chemical Treatment | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | Gas Technology Institute | Supercritical Extraction/Liquid Phase Oxidation | 2 |
| | | | High Voltage Environmental Applications, Inc. | High-Energy Electron Irradiation | 1 |
| | | | Ionics RCC | B.E.S.T. Solvent Extraction Technology | 1 |
| | | | IT Corp. | Batch Steam Distillation and Metal Extraction | 2 |
| | | | IT Corp. | Mixed Waste Treatment Process | 2 |
| Sludge (Cont) | VOCs (Cont) | Physical/Chemical Treatment (Cont) | Terra-Kleen Response Group, Inc. | Solvent Extraction Treatment System | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Terra Vac, Inc. | In Situ and Ex Situ Vacuum Extraction | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | United States Environmental Protection Agency | Field Analytical Screening Program - PCB Method | 3 |
| | | Solidification/ Stabilization | Geo-Con, Inc. | In Situ Solidification and Stabilization Process | 1 |
| | | | WASTECH, Inc. | Solidification and Stabilization | 1 |
| | | | Western Product Recovery Group, Inc. | Coordinate, Chemical Bonding, and Adsorption Treatment | 2 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Strategic Diagnostics Inc. | RaPID Assay® | 3 |
| | | Thermal Destruction | Energy and Environmental Research Corp. | Hybrid Fluidized Bed System | 2 |
| | | | Gas Technology Institute | Fluidized-Bed/Cyclonic Agglomerating Combustor | 2 |
| | | | Sonotech, Inc. | Frequency-Tunable Pulse Combustion System | 1 |
| | | | Texaco, Inc. | Texaco Gasification Process | 1 |
| | | | Vortec Corp. | Vitrification Process | 1 |
| | Other | Solidification/ Stabilization | STC Remediation, A Division of Omega Environmental, Inc. | Organic Stabilization and Chemical Fixation/ Solidification | 1 |
| Soil | Aromatic VOCs | Biological Degradation | Billings and Associates, Inc. | Subsurface Volatilization and Ventilation System (SVVS) | 1 |
| | | | Bio-Rem, Inc. | Augmented In Situ Subsurface Bioremediation Process | 1 |
| Soil (Cont) | Aromatic VOCs (Cont) | Biological Degradation (Cont) | Electrokinetics, Inc. | In Situ Bioremediation by Electrokinetic Injection | 2 |
| | | | Gas Technology Institute | Fluid Extraction - Biological Degradation Process | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Grace Bioremediation Technologies | DARAMEND™ Bioremediation Technology | 1 |
| | | | Harding Lawson Associates | Two Zone, Plume Interception. In Situ Treatment Technology | 2 |
| | | | Hazardous Substance Management Research Center at New Jersey Institute of Technology, and Rutgers, the State U. of New Jersey | Pneumatic Fracturing and Bioremediation Process | 2 |
| | | | Micro-Bac International Inc. | Microbial Degradation PCBs | 1 |
| | | | National Risk Management Research Laboratory | Bioventing | 1 |
| | | | New York State Dept. of Environment Conservation/ENSR Consulting and Larson Engineers | Ex Situ Biovault | 1 |
| | | | New York State Dept. of Environmental Conservation/R.E. Wright Environmental, Inc. | In Situ Bioventing Treatment System | 1 |
| | | | IT Corp. | Oxygen Microbubble In Situ Bioremediation | 2 |
| | | Contaminant Survey Systems | W.L. Gore and Associates, Inc. | GORE-SORBER Screening Survey | 2 |
| | | Materials Handling | National Risk Management Research Laboratory, the U of Cincinnati and FRX, Inc. | Hydraulic Fracturing | 1 |
| Soil (Cont) | Aromatic VOCs (Cont) | Materials Handling (Cont) | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical Thermal Desorption | Biotherm, LLC | Biotherm Process™ | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Hughes Environmental Systems, Inc. | Steam Enhanced Recovery Process | 1 |
| | | | Maxymillian Technologies, Inc. | Thermal Desorption System | 1 |
| | | | NOVATERRA Associates | In-Situ Soil Treatments, (Steam/Air Stripping) | 1 |
| | | | Recycling Sciences International, Inc. | Desorption and Vapor Extraction System | 1 |
| | | | SoilTech ATP Systems, Inc. | Anaerobic Thermal Processor | 1 |
| | | | Roy F. Weston, Inc. | Low Temperature Thermal Treatment (LT3™) System | 1 |
| | | Physical/Chemical Treatment | Arctic Foundations, Inc. | Cryogenic Barrier | 1 |
| | | | ARS Technologies, Inc. | Pneumatic Fracturing Extraction™ and Catalytic Oxidation | 1 |
| | | | Bergmann, a Division of Linatex, Inc. | Soil and Sediment Washing | 1 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | Electrokinetics, Inc. | Electrokinetic Soil Processing | 1 |
| | | | Energia, Inc. | Reductive Thermal and Photo-Thermal Oxidation for Enhanced Conversion of Chlorocarbons | 2 |
| | | | Gas Technology Institute | Supercritical Extraction/Liquid Phase Oxidation | 2 |
| | | | High Voltage Environmental Application, Inc. | High-Energy Electron Irradiation | 1 |
| | | | Ionics RCC | B.E.S.T. Solvent Extraction Technology | 1 |
| Soil (Cont) | Aromatic VOCs (Cont) | Physical/Chemical Treatment (Cont) | IT Corp. | Mixed Waste Treatment Process | 2 |
| | | | KSE, Inc. | Adsorption-Integrated-Reaction Process | 1/2 |
| | | | Pulse Sciences, Inc. | X-Ray Treatment of Organically Contaminated Soils | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| Soil (Cont) | | | Terra Vac, Inc. | In Situ and Ex Situ Vacuum Extraction | 1 |
| | | | Roy F. Weston, Inc./JEG Technologies | UVB - Vacuum Vaporizing Well | 1 |
| | | | Xerox Corp. | 2-PHASE™ EXTRACTION Process | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | HNU Systems, Inc. | HNU GC 311D Portable Gas Chromatograph | 3 |
| | | | Photovac Monitoring Instruments | PE Photovac Voyager Portable Gas Chromatograph | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | | U.S. EPA | Field Analytical Screening Program - PCB Method | 3 |
| | | Samplers | Geoprobe Systems | Large Bore Soil Sampler | 3 |
| | | Sensors | Fugro Geosciences, Inc. | Rapid Optical Screening Tool | 3 |
| | | Solidification/ Stabilization | Geo Con, Inc. | In Situ Solidification and Stabilization Process | 1 |
| | | | WASTECH, Inc. | Solidification and Stabilization | 1 |
| | | | Western Product Recovery Group, Inc. | Coordinate, Chemical Bonding, and Adsorption Treatment | 2 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Hanby Environmental Laboratory Procedures, Inc. | Test Kits for Organic Contaminants in Soil and Water | 3 |
| | | Thermal Destruction | Sonotech, Inc. | Frequency Tunable Pulse Combustion System | 1 |
| | Aromatic VOCs (Cont) | Thermal Destruction (Cont) | Texaco, Inc. | Texaco Gasification Process | 1 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | | | Vortec Corp. | Vitrification Process | 1 |
| | Cyanide | Biological Degradation | Pintail Systems, Inc. | Spent Ore Bioremediation Process | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Physical/Chemical Treatment | Arctic Foundations, Inc. | Cryogenic Barrier | 1 |
| | | | E&C Williams, Inc. | Calcium Sulfide & Calcium Polysulfide Technologies | 1 |
| | Diesel | Materials Handling | National Risk Management Research Laboratory, U. of Cincinnati, and FRX Inc. | Hydraulic Fracturing | 1 |
| | | Physical/Chemical Treatment | Arctic Foundations, Inc. | Cryogenic Barrier | 1 |
| | | | Geokinetics International, Inc. | Electroheat-Enhanced Nonaqueous-Phase Liquids Removal | 1 |
| | | | SIVE Services | Steam Injection and Vacuum Extraction | 1 |
| | | Spectrometer | SiteLAB Corporation | Ultraviolet Fluorescence Spectroscopy | 3 |
| | Dioxins | Biological Degradation | Biotrol® | Soil Washing System | 1 |
| | | | Gas Technology Institute | Fluid Extraction - Biological Degradation Process | 2 |
| | | Chemical Thermal Desorption | Biotherm, LLC | Biotherm Process™ | 1 |
| | | Materials Handling | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical Thermal Desorption | ELI Eco Logic Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | | ELI Eco Logic, Inc. | Thermal Desorption Unit | 1 |
| Soil (Cont) | Dioxins (Cont) | Physical/Chemical Thermal Desorption (Cont) | Recycling Sciences International, Inc. | Desorption and Vapor Extraction System | 1 |
| | | | SoilTech ATP Systems, Inc. | Anaerobic Thermal Processor | 1 |
| | | | Roy F. Weston, Inc. | Low Temperature Thermal Treatment (LT3™) System | 1 |
| | | Physical/Chemical Treatment | Arctic Foundations, Inc. | Cryogenic Barrier | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | ART International, Inc. | Low-Energy Extraction Process (LEEP) | 2 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | High Voltage Environmental Applications, Inc. | High-Energy Electron Irradiation | 1 |
| | | | Ionics RCC | B.E.S.T. Solvent Extraction Technology | 1 |
| | | | IT Corp. | Mixed Waste Treatment Process | 2 |
| | | | National Risk Management Research Laboratory | Base-Catalyzed Decomposition Process | 1 |
| | | | Terra-Kleen Response Group, Inc. | Solvent Extraction Treatment System | 1 |
| | | | Trinity Environmental Technologies, Inc. | PCB- and Organochlorine-Contaminated Soil Detoxification | 2 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | Samplers | Geoprobe Systems | Large Bore Soil Sampler | 3 |
| | | Solidification/ Stabilization | Geosafe Corp. | GeoMelt Vitrification | 1 |
| | | | WASTECH, Inc. | Solidification and Stabilization | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| Soil (Cont) | Dioxins (Cont) | Thermal Destruction (Cont) | Energy and Environmental Research Corp. | Reactor Filter System | 2 |
| | | | Gas Technology Institute | Fluidized-Bed/Cyclonic Agglomerating Combustor | 2 |
| | | | Terra Therm, Inc. | In-Situ Thermal Destruction | 1 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | | | Vortec Corp. | Oxidation and Verification Process | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | Explosives | Biological Degradation | U. of Idaho Research Foundation | The SABRE™ Process | 1 |
| | | Contaminant Survey Systems | Quadrel Services, Inc. | Emflux Soil-Gas Survey System | 3 |
| | | | W.L. Gore and Associates, Inc. | GORE-SORBER Screening Survey | 3 |
| | | Physical/Chemical Thermal Desorption | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | Thermal Destruction | Terra Therm, Inc. | In-Situ Thermal Destruction | 1 |
| | Furans | Biological Degradation | Biotrol® | Soil Washing System | 1 |
| | | | Gas Technology Institute | Fluid Extraction - Biological Degradation Process | 2 |
| | | Materials Handling | U.S. EPA | Field Analytical Screening Program - PCB Method | 3 |
| | | Physical/Chemical Thermal Desorption | ELI Eco Logic Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | | ELI Eco Logic, Inc. | Thermal Desorption Unit | 1 |
| | | | Recycling Sciences International, Inc. | Desorption and Vapor Extraction System | 1 |
| | | | SoilTech ATP Systems, Inc. | Anaerobic Thermal Processors | 1 |
| | | | Roy F. Weston, Inc. | Low Temperature Thermal Treatment (LT3™) System | 1 |
| | | Physical/Chemical Treatment | Arctic Foundations, Inc. | Cryogenic Barrier | 1 |
| Soil (Cont) | Furans (Cont) | Physical/Chemical Treatment (Cont) | ART International, Inc. | Low-Energy Extraction Process (LEEP) | 2 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | High Voltage Environmental Applications, Inc. | High-Energy Electron Irradiation | 1 |
| | | | Ionics RCC | B.E.S.T. Solvent Extraction Technology | 1 |
| | | | IT Corp. | Mixed Waste Treatment Process | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | National Risk Management Research Laboratory | Base, Catalyzed Decomposition Process | 1 |
| | | | Terra-Kleen Response Group, Inc. | Solvent Extraction Treatment System | 1 |
| | | | Trinity Environmental Technologies, Inc. | PCB- and Organochlorine-Contaminated Soil Detoxification | 2 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | Samplers | Geoprobe Systems | Large Bore Soil Sampler | 3 |
| | | Solidification/ Stabilization | Geosafe Corp. | GeoMelt Vitrification | 1 |
| | | | WASTECH, Inc. | Solidification and Stabilization | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | Energy and Environmental Research Corp. | Reactor Filter System | 2 |
| | | | Gas Technology Institute | Fluidized-Bed/Cyclonic Agglomerating Combustor | 2 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | | | Vortec Corp. | Vitrification Process | 1 |
| Soil (Cont) | Gasoline | Contaminant Survey Systems | W.L. Gore and Associates, Inc. | GORE-SORBER Screening Survey | 3 |
| | | Materials Handling | National Risk Management Research Laboratory, U. of Cincinnati and FRX, Inc. | Hydraulic Fracturing | 1 |
| | | Physical/Chemical Thermal Desorption | SIVE Services | Steam Injection and Vacuum Extraction | 1 |
| | | Physical/Chemical Treatment | Arctic Foundations, Inc. | Cryogenic Barrier | 1 |
| | | Samplers | Geoprobe Systems | Large Bore Soil Sampler | 3 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Spectrometer | SiteLAB Corporation | Ultraviolet Fluorescence Spectroscopy | 3 |
| | Halogenated VOCs | Biological Degradation | Harding Lawson Associates | Two Zone, Plume Interception. In Situ Treatment Technology | 2 |
| | | | Bio-Rem, Inc. | Augmented In Situ Subsurface Bioremediation Process | 1 |
| | | | New York State Dept. of Environmental Conservation/R.E. Wright Environmental, Inc. | In Situ Bioventing Treatment System | 1 |
| | | | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical Treatment - Biological Degradation | Lasagna™ Public Private Partnership | Lasagna™ In Situ Soil Remediation | 1 |
| | | Physical/Chemical Thermal Desorption | Hughes Environmental Systems, Inc. | Steam Enhanced Recovery Process | 1 |
| | | | KAI Technologies, Inc./Brown and Root Environmental | Radio Frequency Heating | 1 |
| | | | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| Soil (Cont) | Halogenated VOCs (Cont) | Physical/Chemical Thermal Desorption (Cont) | NOVATERRA Associates | In Situ Soil Treatments, (Steam/Air Stripping) | 1 |
| | | | IT Corporation | X*TAX* Thermal Desorption | 1 |
| | | | Recycling Sciences International, Inc. | Desorption and Vapor Extraction System | 1 |
| | | | SoilTech ATP Systems, Inc. | Anaerobic Thermal Processor | 1 |
| | | | Roy F. Weston, Inc. | Low Temperature Thermal Treatment (LT3™) System | 1 |
| | | | Xerox Corp. | 2-PHASE™ EXTRACTION Process | 1 |
| | | Physical/Chemical Treatment | Arctic Foundations, Inc. | Cryogenic Barrier | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | Photovac Monitoring Instruments | PE Photovac Voyager Portable Gas Chromatograph | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | | U.S. EPA | Field Analytical Screening Program - PCB Method | 3 |
| | | Samplers | Geoprobe Systems | Large Bore Soil Sampler | 3 |
| | | Solidification/ Stabilization | Geo Con, Inc. | In Situ Solidification and Stabilization Process | 1 |
| | | | Geosafe Corp. | GeoMelt Vitrification | 1 |
| | | | WASTECH, Inc. | Solidification and Stabilization | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Dexsil Corporation | Environmental Test Kits | 3 |
| | | Thermal Destruction | Energy and Environmental Research Corp. | Hybrid Fluidized Bed System | 2 |
| | | | Svedala Industries, Inc. | Pyrokiln Thermal Encapsulation Process | 2 |
| | | | Texaco, Inc. | Texaco Gasification Process | 1 |
| Soil (Cont) | Halogenated VOCs (Cont) | Thermal Destruction (Cont) | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | | | Vortec Corp. | Vitrification Process | 1 |
| | Heavy Metals | Chemical Treatment | Concurrent Technologies | Organics Destruction Metals Stabilization | 2 |
| | | Field Portable X-Ray Fluorescence | Edax Portable Products Division | Metal Analysis Probe (MAP®) Portable Assays | 3 |
| | | Physical/Chemical Thermal Desorption | Electrokinetics, Inc. | Electrokinetic Extraction | 1 |
| | | Physical/Chemical Treatment | Geokinetics International, Inc. | Electrokinetics for Lead Recovery | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Solidification/ Stabilization | Rocky Mountain Remediation Services, LLC | Envirobond Solution | 1 |
| | | | Star Organics, LLC | Soil Rescue Remediation Fluid | 1 |
| | Heavy Minerals | Materials Handling | Montana College of Mineral Science and Technology | Campbell Centrifugal Jig | 2 |
| | | Samplers | Art's Manufacturing and Supply | AMS™ Dual-Tube Liner Soil Sampler | 3 |
| | | | Simulprobe Technologies, Inc. | Core Barrel Soil Sampler | 3 |
| | | Solidification/ Stabilization | Gas Technology Institute | Cement-Lock Technology | 1 |
| | | Thermal Destruction | Gas Technology Institute | Cement-Lock Technology | 1 |
| | Herbicides | Biological Degradation | Biotrol® | Soil Washing System | 1 |
| | | | Electrokinetics, Inc. | In Situ Bioremediation by Electrokinetic Injection | 2 |
| | | | Gas Technology Institute | Fluid Extraction - Biological Degradation Process | 2 |
| | | | Grace Bioremediation Technologies | DARAMEND™ Bioremediation Technology | 1 |
| Soil (Cont) | Herbicides (Cont) | Biological Degradation (Cont) | Phytokinetics, Inc. | Phytoremediation of Contaminated Soils | 2 |
| | | | U. of Idaho Research Foundation | The SABRE™ Process | 1 |
| | | Materials Handling | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical Chemical Treatment - Biological Degradation | Pharmacia Corporation | Lasagna™ In Situ Soil Remediation | 1 |
| | | Physical/Chemical Thermal Desorption | ELI Eco Logic, Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | | ELI Eco Logic, Inc. | Thermal Desorption Unit | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Maxymillion Technologies, Inc. | Thermal Desorption System | 1 |
| | | | IT Corporation | X*TAX™ Thermal Desorption | 1 |
| | | | Recycling Sciences International, Inc. | Desorption and Vapor Extraction System | 1 |
| | | | Smith Environmental Technologies Corp. | Low Temperature Thermal Aeration (LTTA®) | 1 |
| | | | SoilTech ATP Systems, Inc. | Anaerobic Thermal Processors | 1 |
| | | | Roy F. Weston, Inc. | Low Temperature Thermal Treatment (LT3™) System | 1 |
| | | Physical/Chemical Treatment | Arctic Foundations, Inc. | Cryogenic Barrier | 1 |
| | | | ART International, Inc. | Low-Energy Extraction Process (LEEP) | 2 |
| | | | Bergmann, a Division of Linatex, Inc. | Soil and Sediment Washing | 1 |
| | | | Center for Hazardous Materials Research | Organics Destruction and Metals Stabilization | 2 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| Soil (Cont) | Herbicides (Cont) | Physical/Chemical Treatment (Cont) | High Voltage Environmental Applications, Inc. | High-Energy Electron Irradiation | 1 |
| | | | Ionics RCC | B.E.S.T. Solvent Extraction Technology | 1 |
| | | | IT Corp. | Mixed Waste Treatment Process | 2 |
| | | | National Risk Management Research Laboratory | Base-Catalyzed Decomposition Process | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | Samplers | Geoprobe Systems | Large Bore Soil Samplers | 3 |
| | | Solidification/ Stabilization | Chemfix Technologies, Inc. | Solidification and Stabilization | 1 |
| | | | WASTECH, Inc. | Solidification and Stabilization | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| Soil (Cont) | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Strategic Diagnostics, Inc., Corp. | RaPID Assay® | 3 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | | | Vortex Corp. | Vitrification Process | 1 |
| | Inorganics | Chemical Treatment | Kvaerner Energy & Environmental | Chemical Treatment | 2 |
| | | Physical/Chemical Treatment | Electrokinetics, Inc. | Electrokinetic Extraction | 1 |
| | | | Electro-Petroleum, Inc. | Electro-Kinetically Aided Remediation | 1 |
| | | Solidification/ Stabilization | Gas Technology Institute | Cement-Lock Technology | 1 |
| | | Thermal Destruction | Gas Technology Institute | Cement-Lock Technology | 1 |
| | Mercury | Contaminant Survey Systems | Quadrel Services, Inc. | Emflux Soil-Gas Survey System | 3 |
| | Mercury (Cont) | Contaminant Survey Systems (Cont) | Radiometer Analytical Group | Anodic Voltammetry of Mercury in Soil | 3 |
| | | Physical/Chemical Treatment | Bionebraska, Inc. | BiMelyze® Mercury Immunoassay | 3 |
| | Metals | Biological Degradation | COGNIS, Inc. | Biological/Chemical Treatment | 1 |
| | | | Geo-Microbial Technologies, Inc. | Metals Release and Removal of Wastes | 2 |
| | | | Phytotech | Phytoremediation Technology | 1 |
| | | | Pintail Systems, Inc. | Biomineralization of Metals | 2 |
| | | | Pintail Systems, Inc. | Spend Ore Bioremediation Process | 1 |
| | | Contaminant Survey Systems | W.L. Gore and Associates, Inc. | GORE-SORBER Screening Survey | 3 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Field Portable X-Ray Fluorescence | Metorex, Inc. | Field Portable X-Ray Fluorescence Analysis | 3 |
| | | | TN Spectrace | 9000 X-Ray Fluorescence Analyzer and Lead X-Ray Fluorescence Analyzer | 3 |
| | | Materials Handling | AEA Technology Environment | Soil Separation and Washing Process | 2 |
| | | | Montana College of Mineral Science and Technology | Air-Sparged Hydrocyclone | 2 |
| | | | Montana College of Mineral Science and Technology | Campbell Centrifugal Jig | 2 |
| | | | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| | | | U. of South Carolina | In Situ Mitigation of Acid Water | 2 |
| | | Physical Chemical Treatment - Biological Degradation | Pharmacia Corporation | Lasagna™ In Situ Soil Remediation | 1 |
| | | Physical/Chemical Thermal Desorption | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| Soil (Cont) | Metals (Cont) | Physical/Chemical Thermal Desorption (Cont) | Geotech Development Corp. | Cold Top Ex Situ Verification of Chromium-Contaminated Soils | 1 |
| | | Physical/Chemical Treatment | Arctic Foundations, Inc. | Cryogenic Barrier | 1 |
| | | | Battelle Memorial Institute | In Situ Electroacoustic Soil Decontamination | 2 |
| | | | Bergmann, a Division of Linatex, Inc. | Soil and Sediment Washing | 1 |
| | | | BioGenesis Enterprises, Inc. | BioGenesis℠ Soil & Sediment Washing Process | 1 |
| | | | Brice Environmental Services, Corp. | Soil Washing Process | 1 |
| | | | Center for Hazardous Materials Research | Acid Extraction Treatment System | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | COGNIS, Inc. | TERRAMET Soil Remediation System | 1 |
| | | | E&C Williams, Inc. | Calcium Sulfide & Calcium Polysulfide Technology | 1 |
| | | | Electrokinetics, Inc. | Electrokinetic Soil Processing | 1 |
| | | | General Atomics, Nuclear Remediation Technologies Division | Acoustic Barrier Particulate Separator | 2 |
| | | | Geokinetics International, Inc. | Electrokinetics for NSFO Mobilization | 1 |
| | | | IT Corp. | Batch Steam Distillation Metal Extraction | 2 |
| | | | IT Corp. | Chelation/Electrodeposition of Toxic Metals from Soils | 2 |
| | | | IT Corp. | Mixed Treatment Process | 2 |
| | | | Lewis Environmental Services, Inc./ Hickson Corp. | Chromated Copper Arsenate Soil Leaching Process | 2 |
| Soil (Cont) | Metals (Cont) | Physical/Chemical Treatment (Cont) | Morrison Knudsen Corp./Spetstamponazh geologia Enterprises/STG Technologies | Clay-Base Grouting Technology | 1 |
| | | | National Risk Management Research Laboratory | Volume Reduction Unit | 1 |
| | | | Sandia National Laboratory | In Situ Electrokinetic Extraction System | 1 |
| | | | Toronto Harbor Commission | Soil Recycling | 1 |
| | | | U. of Houston | Concentrated Chlorine Extraction and Recovery of Lead | 2 |
| | | Portable Gas Chromatographs | HNU Systems, Inc. | HNU GC 311D Portable Gas Chromatograph | 3 |
| | | Samplers | Art's Manufacturing and Supply | AMS™ Dual-Tube Liner Soil Sampler | 3 |
| | | | Geoprobe Systems | Large Bore Soil Sampler | 3 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Simulprobe Technologies, Inc. | Core Barrel Soil Sampler | 3 |
| | | Solidification/ Stabilization | Chemfix Technologies, Inc. | Solidification and Stabilization | 1 |
| | | | E&C Williams, Inc. | Chemical Stabilization of Mercury Mining Wastes | 1 |
| | | | Ferro Corp. | Waste Vitrification Through Electric Melting | 2 |
| | | | Funderburk & Associates | Dechlorination and Immobilization | 1 |
| | | | Gas Technology Institute | Cement-Lock Technology | 1 |
| | | | Geo-Con, Inc. | In Situ Solidification and Stabilization Process | 1 |
| | | | Geosafe Corp. | GeoMelt Vitrification | 1 |
| | | | Metso Minerals Industries, Inc. | Phyrokiln Thermal Encapsulation Process | 2 |
| Soil (Cont) | Metals (Cont) | Solidification/ Stabilization (Cont) | Minergy | Thermal Sediment Reuse Technology | 1 |
| | | | Rocky Mountain Remediation Services, LLC | Envirobond Solution | 1 |
| | | | Sevenson Environmental Services, Inc. | MAECTITE® Chemical Treatment Process | 1 |
| | | | Soliditech, Inc. | Solidification and Stabilization | 1 |
| | | | Star Organics, LLC | Soil Rescue Remediation Fluid | 1 |
| | | | STC Remediation a Division of Omega Environmental, Inc. | Organic Stabilization and Chemical Fixation/ Solidification | 1 |
| | | | WASTECH, Inc. | Solidification and Stabilization | 1 |
| | | | Western Product Recovery Group, Inc. | Coordinate, Chemical Bonding, and Adsorption Treatment | 2 |
| | | Thermal Destruction | American Combusion, Inc. | PYRETRON® Thermal Destruction | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | Concurrent Technologies | Smelting Lead-Containing Wastes | 2 |
| | | | Energy and Environmental Research Corp. | Hybrid Fluidized Bed System | 2 |
| | | | Energy and Environmental Research Corp. | Reactor Filter System | 2 |
| | | | Horsehead Resource Development Co., Inc. | Flame Reactor | 1 |
| | | | Gas Technology Institute | Cement-Lock Technology | 1 |
| | | | Gas Technology Institute | Fluidized-Bed/Cyclonic Agglomerating Combustor | 2 |
| | | | Minergy Corporation | Glass Furnace Technology for Dredged Sediments | 1 |
| Soil (Cont) | Metals (Cont) | Thermal Destruction (Cont) | PSI Technologies, A Division of Physical Sciences Inc. | Metals Immobilization and Decontamination of Aggregate Solids | 2 |
| | | | Svedala Industries, Inc. | Pyrokiln Thermal Encapsulation Process | 2 |
| | | | Vortec Corp. | Vitrification Process | 1 |
| | Organics | Biological Degradation | Harding ESE, a MacTech Co. | Two-Zone, Plume Interception. In Situ Treatment Strategy | 1/2 |
| | | | Micro-Bac International, Inc. | Microbial Degradation of PCBs | 1 |
| | | Chemical Treatment | Concurrent Technologies | Organic Destruction & Metals Stabilization | 2 |
| | | | Kaverner Energy & Environment | Chemical Treatment | 1 |
| | | Physical/Chemical Treatment | Arctic Foundations, Inc. | Cryogenic Barrier | 1 |
| | | | Current Environmental Solutions | Six-Phase Heating of TCE | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Electro-Petroleum, Inc. | Electro-Kinetically Aided Remediation | 1 |
| | | | IT Corporation | $KMnO_4$ (Potassium Permanganate Oxidation of TCE) | 1 |
| | | | Pharmacia Corporation | Lasagna™ In Situ Soil Remediation | 1 |
| | | Sensors | Geoprobe Systems | Geoprobe Conductivity System | 3 |
| | | Solidification/ Stabilization | Gas Technology Institute | Cement-Lock Technology | 1 |
| | | | RKK, Ltd. | CRYOCELL® | 1 |
| | | Thermal Destruction | Current Environmental Solutions | Six-Phase Heating of TCE | 1 |
| | | | Gas Technology Institute | Cement-Lock Technology | 1 |
| | | | Gruppo Italimpresse | Infrared Thermal Destruction | 1 |
| Soil (Cont) | Organics (Cont) | Thermal Destruction (Cont) | Terra Therm, Inc. | In Situ Thermal Destruction | 1 |
| | PAHs | Biological Degradation | X-19 Biological Products | Microbial Degradation of PCBs | 1 |
| | | | COGNIS, Inc. | Biological/Chemical Treatment | 2 |
| | | | Ecova Corp. | Bioslurry Reactor | 1 |
| | | | Environmental BioTechnologies, Inc. | Fungal Degradation Process | 2 |
| | | | Gas Technology Institute | Fluid Extraction Biological Degradation Process | 2 |
| | | | Micro-Bac® International, Inc. | Bioaugmentation Process | 1 |
| | | | Remediation Technology, Inc. | Liquid and Solids Biological Treatment | 1 |
| | | Chemical Thermal Desorption | Biotherm, L.C.C. | Biotherm Process™ | 1 |
| | | Cone Penetrometers | Space and Naval Warfare Systems Center | SCAPS Cone Penetrometer | 3 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| Soil (Cont) | | Contaminant Survey | Fugro Geosciences, Inc. | Rapid Optical Screening Tools | 3 |
| | | Contaminant Survey Systems | W.L. Gore and Associates, Inc. | GORE-SORBER Screening Survey | 3 |
| | | Physical/Chemical Thermal Desorption | Geokinetics International, Inc. | Electroheat-Enhanced Nonaqueous Phase Liquids Removal | 1 |
| | | | Maxymillian Technologies, Inc. | Thermal Desorption System | 1 |
| | | | Recycling Sciences International, Inc. | Desorption and Vapor Extraction System | 1 |
| | | Physical/Chemical Treatment | Arctic Foundations, Inc. | Cryogenic Barrier | 1 |
| | | | Bergmann. A Division of Linatex, Inc. | Soil and Sediment Washing | 1 |
| | PAHs (Cont) | Physical/Chemical Treatment (Cont) | BioGenesis Enterprises, Inc. | BioGenesis™ Soil & Sediment Washing Process | 1 |
| | | Portable Gas Chromatograph | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | Samplers | Clements, Inc. | JMC Environmental Subsoil Probe | 3 |
| | | Sensors | Fugro Geosciences, Inc. | Rapid Optical Screening Tool | 3 |
| | | Spectrometer | SiteLAB Corporation | Ultraviolet Fluorescence Spectroscopy | 3 |
| | PCBs | Biological Degradation | X-19 Biological Products | Microbial Degradation of PCBs | 1 |
| | | | Gas Technology Institute | Chemical and Biological Treatment | 2 |
| | | | Gas Technology Institute | Fluid Extraction - Biological Degradation Process | 2 |
| | | | Micro-Bac® International, Inc. | Bioaugmentation Process | 1 |
| | | | Phytokinetics, Inc. | Phytoremediation of Contaminated Soils | 2 |
| | | | Phytokinetics, Inc. | Phytoremediation Process | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Field Portable X-Ray Fluorescence | Metorex, Inc. | Fluid Portable X-Ray Fluorescence Analysis | 3 |
| | | Materials Handling | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical Thermal Desorption | Biotherm, LLC | Biotherm Process™ | 1 |
| | | | ELI Eco Logic Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | | ELI Eco Logic, Inc. | Thermal Desorption Unit | 1 |
| | | | KAI Technologies, Inc./Brown and Root Environmental | Radio Frequency Heating | 1 |
| | | | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | | IT Corporation | X*TAX™ Thermal Desorption | 1 |
| Soil (Cont) | PCBs (Cont) | Physical/Chemical Thermal Desorption (Cont) | Recycling Sciences International, Inc. | Desorption and Vapor Extraction System | 1 |
| | | | SoilTech ATP Systems, Inc. | Anaerobic Thermal Processors | 1 |
| | | | Roy F. Weston, Inc. | Low Temperature Thermal Treatment (LT3™) System | 1 |
| | | Physical/Chemical Treatment | Arctic Foundations, Inc. | Cryogenic Barrier | 1 |
| | | | ART International, Inc. | Low-Energy Extraction Process (LEEP) | 2 |
| | | | Bergmann, a Division of Linatex, Inc. | Soil and Sediment Washing | 1 |
| | | | BioGenesis Enterprises, Inc. | BioGenesis℠ Soil & Sediment Washing Process | 1 |
| | | | Center for Hazardous Materials Research | Organics Destruction and Metals Stabilization | 2 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | Commodore Environmental Services, Inc. | Solvated Electron Remediation System | 1 |
| | | | General Atomics | Circulating Bed Combustor | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | High Voltage Environmental Applications, Inc. | High-Energy Electron Irradiation | 1 |
| | | | Ionics RCC | B.E.S.T. Solvent Extraction Technology | 1 |
| | | | IT Corp. | Mixed Waste Treatment Process | 2 |
| | | | IT Corp. | Photolytic and Biological Soil Detoxification | 2 |
| | | | Morrison Knudsen Corp./Spetstamponazh geologia Enterprises/STG Technologies | Clay-Base Grouting Technology | 1 |
| Soil (Cont) | PCBs (Cont) | Physical/Chemical Treatment (Cont) | National Risk Management Research Laboratory | Base-Catalyzed Decomposition Process | 1 |
| | | | State U. of New York at Oswego, Environmental Research Center | Electrochemical Peroxidation of PCB-Contaminated Sediments and Waters | 2 |
| | | | Terra-Kleen Response Group, Inc. | Solvent Extraction Treatment System | 1 |
| | | | Trinity Environmental Technology, Inc. | PCB- and Organochlorine-Contaminated Soil Detoxification | 2 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | HNU Systems, Inc. | HNU GC 311D Portable Gas Chromatograph | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | | U.S. EPA | Field Analytical Screening Program - PCB Method | 3 |
| | | Samplers | Clements, Inc. | JMC Environmental Subsoil Probe | 3 |
| | | | Geoprobe Systems | Large Bore Soil Sampler | 3 |
| | | Solidification/ Stabilization | Chemfix Technologies, Inc. | Solidification and Stabilization | 1 |
| | | | Funderburk & Associates | Dechlorination and Immobilization | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| Soil (Cont) | | | Gas Technology Institute | Cement-Lock Technology | 1 |
| | | | Geo-Con, Inc. | In Situ Solidification and Stabilization Process | 1 |
| | | | Geosafe Corp. | GeoMelt Vitrification | 1 |
| | | | Minergy | Thermal Sediment Reuse Technology | 1 |
| | | | Soliditech, Inc. | Solidification and Stabilization | 1 |
| | | | WASTECH, Inc. | Solidification and Stabilization | 1 |
| | | Test Kits | Dexsil Corporation | Environmental Test Kits | 3 |
| | PCBs (Cont) | Test Kits (Cont) | Hanby Environmental Laboratory Procedure, Inc. | Test Kits for Organic Contaminants in Soil and Water | 3 |
| | | | Millipore Corporation | EnviroGard™ PCP Immunoassay Test Kit | 3 |
| | | | Strategic Diagnostics, Inc. | EnviroGard™ PCB Immunoassay Test Kit | 3 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | Energy and Environmental Research Corp. | Hybrid Fluidized Bed System | 2 |
| | | | Gas Technology Institute | Cement-Lock Technology | 1 |
| | | | Gas Technology Institute | Fluidized-Bed/Cyclonic Agglomerating Combustor | 2 |
| | | | Minergy Corp. | Glass Furnace Technology for Dredged Sediments | 1 |
| | | | Terra Therm, Inc. | In-Situ Thermal Destruction | 1 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | | | Vortec Corp. | Vitrification Process | 1 |
| | PCP | Biological Degradation | X-19 Biological Products | Microbial Degradation of PCBs | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| Soil (Cont) | | | Remediation Technology, Inc. | Liquid and Solids Biological Treatment | 1 |
| | | Physical/Chemical Treatment | Arctic Foundations, Inc. | Cryogenic Barrier | 1 |
| | | Portable Gas Chromatographs | U.S. EPA | Field Analytical Screening Program - PCP Method | 3 |
| | | Physical/Chemical Thermal Desorption | Recycling Sciences International, Inc. | Desorption and Vapor Extraction System | 1 |
| | | Physical/Chemical Treatment | National Risk Management Research Laboratory | Volume Reduction Unit | 1 |
| | PCP (Cont) | Physical/Chemical Treatment (Cont) | Trinity Environmental Technologies, Inc. | PCB- and Organochlorine-Contaminated Soil Detoxification | 2 |
| | | Test Kits | Strategic Diagnostics, Inc. | Ensys Penta Test System | 3 |
| | | | Strategic Diagnostics, Inc. | EnviroGard™ PCB Immunoassay Test Kit | 3 |
| | | | Strategic Diagnostics, Inc. | (RaPID Assay®) | 3 |
| | Pesticides | Biological Degradation | X-19 Biological Products | Microbial Degradation of PCBs | 1 |
| | | | Biotrol® | Soil Washing System | 1 |
| | | | Electrokinetics, Inc. | In Situ Bioremediation by Electrokinetic Injection | 2 |
| | | | Gas Technology Institute | Chemical and Biological Treatment | 2 |
| | | | Gas Technology Institute | Fluid Extraction - Biological Degradation Process | 2 |
| | | | Grace Bioremediation Technologies | DARAMEND™ Bioremediation Technology | 1 |
| | | | Phytokinetics, Inc. | Phytoremediation of Contaminated Soils | 2 |
| | | | Phytokinetics, Inc. | Phytoremediation Process | 1 |
| | | Contaminant Survey Systems | W.L. Gore and Associates, Inc. | GORE-SORBER Screening Survey | 3 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Materials Handling | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical Thermal Desorption | Biotherm, LLC | Biotherm Process™ | 1 |
| | | | ELI Eco Logic Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | | ELI Eco Logic, Inc. | Thermal Desorption Unit | 1 |
| | | | KAI Technologies, Inc./Brown and Root Environmental | Radio Frequency Heating | 1 |
| | | | OHM Remediation Services, Corp. | X*TAX™ Thermal Desorption | 1 |
| Soil (Cont) | Pesticides (Cont) | Physical/Chemical Thermal Desorption (Cont) | Recycling Sciences International, Inc. | Desorption and Vapor Extraction System | 1 |
| | | | Smith Environmental Technologies Corp. | Low Temperature Thermal Aeration (LTTA) | 1 |
| | | | SoilTech ATP Systems, Inc. | Anaerobic Thermal Processors | 1 |
| | | | Roy F. Weston, Inc. | Low Temperature Thermal Treatment ($LT^{3}$™) System | 1 |
| | | Physical/Chemical Treatment | Arctic Foundations, Inc. | Cryogenic Barrier | 1 |
| | | | ART International, Inc. | Low-Energy Extraction Process (LEEP) | 2 |
| | | | Bergmann, a Division of Linatex, Inc. | Soil and Sediment Washing | 1 |
| | | | Center for Hazardous Materials Research | Organics Destruction and Metals Stabilization | 2 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | Commodore Environmental Services, Inc. | Solvated Electron Remediation System | 1 |
| | | | Electrokinetics, Inc. | Electrokinetic Soil Processing | 1 |
| | | | General Atomics | Circulating Bed Combustor | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | High Voltage Environmental Applications, Inc. | High-Energy Electron Irradiation | 1 |
| | | | Ionics RCC | B.E.S.T. Solvent Extraction Technology | 1 |
| | | | IT Corp. | Mixed Waste Treatment Process | 2 |
| | | | IT Corp. | Photolytic and Biological Soil Detoxification | 2 |
| | | | Morrison Knudsen Corp./Spetstamponazh geologia Enterprises/STG Technologies | Clay-Base Grouting Technology | 1 |
| Soil (Cont) | Pesticides (Cont) | Physical/Chemical Treatment (Cont) | National Risk Management Research Laboratory | Base-Catalyzed Decomposition Process | 1 |
| | | | State U. of New York at Oswego, Environmental Research Center | Electrochemical Peroxidation of PCB-Contaminated Sediments and Waters | 2 |
| | | | Terra-Kleen Response Group, Inc. | Solvent Extraction Treatment System | 1 |
| | | | Trinity Environmental Technologies, Inc. | PCB- and Organochlorine-contaminated Soil Detoxification | 2 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | | U.S. EPA | Field Analytical Screening Program - PCB Method | 3 |
| | | Samplers | Art's Manufacturing and Supply | AMS™ Dual-Tube Liner Soil Sampler | 3 |
| | | | Clements, Inc. | JMC Environmental Subsoil Probe | 3 |
| | | | Geoprobe Systems | Large Bore Soil Sampler | 3 |
| | | | Simulprobe Technologies, Inc. | Core Barrel Soil Sampler | 3 |
| | | Solidification/ Stabilization | Chemfix Technologies, Inc. | Solidification and Stabilization | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Funderburk & Associates | Dechlorination and Immobilization | 1 |
| | | | Geo-Con, Inc. | In Situ Solidification and Stabilization Process | 1 |
| | | | Soliditech, Inc. | Solidification and Stabilization | 1 |
| | | | WASTECH, Inc | Solidification and Stabilization | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Dexsil Corporation | Environmental Test Kits | 3 |
| | | | Strategic Diagnostics, Inc. | Ensys Penta Test System | 3 |
| Soil (Cont) | Pesticides (Cont) | Test Kits (Cont) | Hanby Environmental Laboratory Procedure, Inc. | Test Kits for Organic Contaminants in Soil and Water | 3 |
| | | | Strategic Diagnostics, Inc. | RaPID Assay® | 3 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | Energy and Environmental Research Corp. | Hybrid Fluidized Bed System | 2 |
| | | | Gas Technology Institute | Fluidized-Bed/Cyclonic Agglomerating Combustor | 2 |
| | | | Terra Therm, Inc. | In-Situ Thermal Destruction | 1 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | | | VORTEC Corp. | Vitrification Process | 1 |
| | Petroleum Hydrocarbons | Biological Degradation | X-19 Biological Product | Microbial Degradation of PCBs | 1 |
| | | | COGNIS, Inc. | Biological/Chemical Treatment | 2 |
| | | | Ecova Corp. | Bioslurry Reactor | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Hazardous Substance Management Research Center at New Jersey Institute of Technology, and Rutgers, the State U. of New Jersey | Pneumatic Fracturing and Bioremediation Process | 2 |
| | | | Micro-Bac® International, Inc. | Bioaugmentation Process | 1 |
| | | | Remediation Technologies, Inc. | Liquid and Solids Biological Treatment | 1 |
| | | Cone Penetrometers | Space and Naval Warfare Systems Center | SCAPS Cone Penetrometer | 3 |
| | | | Tri-Services | Site Characterization Analysis Penetrometer System (SCAPS) | 3 |
| Soil (Cont) | Petroleum Hydrocarbons (Cont) | Contaminant Survey Systems | W.L. Gore and Associates, Inc. | GORE-SORBER Screening Survey | 3 |
| | | Materials Handling | National Risk Management Research Laboratory. U. of Cincinnati and FRX, Inc. | Hydraulic Fracturing | 1 |
| | | Physical/Chemical Thermal Desorption | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | | SIVE Services | Steam Injection and Vacuum Extraction | 1 |
| | | | Smith Environmental Technologies, Corp. | Low, Temperature Thermal Aeration (LTTA®) | 1 |
| | | Physical/Chemical Treatment | Arctic Foundations, Inc. | Cryogenic Barrier | 1 |
| | | Portable Gas Chromatographs | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | Spectrometer | Environmental Systems Corporation | Ultraviolet Fluorescence Spectroscopy | 3 |
| | | | SiteLAB Corporation | Ultraviolet Fluorescence Spectroscopy | 3 |
| | | | Strategic Diagnostics, Inc. | Immunoassay and Colorrimetry | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Wilks Enterprise, Inc. | Infrared Analysis | 3 |
| | | Solidification/ Stabilization | Soliditech, Inc. | Solidification and Stabilization | 1 |
| | | Test Kits | CHEMetrics Inc. and AZUR Environmental Ltd. | Friedel-Crafts Alkylation Reaction & Colorimetry | 3 |
| | Radionuclides | Materials Handling | Thermo Nutech, Inc. | Segmented Gate System | 2 |
| | | Physical/Chemical Treatment | Arctic Foundations, Inc. | Cryogenic Barrier | 1 |
| | | | Bergmann, a Division of Linatex, Inc. | Soil and Sediment Washing | 1 |
| | | | Electrokinetics, Inc. | Electrokinetic Extraction | 1 |
| Soil (Cont) | Radionuclides (Cont) | Physical/Chemical Treatment (Cont) | IT Corp. | Mixed Waste Treatment Process | 2 |
| | | Solidification/ Stabilization | Sevenson Environmental Services, Inc. | MAECTITE® Chemical Treatment Process | 1 |
| | | | WASTECH, Inc. | Solidification and Stabilization | 1 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | Terra Therm, Inc. | In-Situ Thermal Destruction | 1 |
| | SVOCs | Biological Degradation | Harding Lawson Associates | Two Zone, Plume Interception, In Situ Treatment Technology | 2 |
| | | | Biotrol® | Soil Washing System | 1 |
| | | | Ecova Corp. | Bioslurry Reactor | 1 |
| | | | Gas Technology Institute | Chemical and Biological Treatment | 2 |
| | | | Gas Technology Institute | Fluid Extraction - Biological Degradation Process | 2 |
| | | | Grace Bioremediation Technologies | DARAMEND™ Bioremediation Technology | 1 |
| | | | National Risk Management Research Laboratory | Bioventing | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | National Risk Management Research Laboratory and INTECH 180 Corp. | Fungal Treatment Technology | 1 |
| | | | New York State Dept. of Environment Conservation/ENSR Consulting and Larson Engineers | Ex Situ Biovault | 1 |
| | | | New Yew State Dept. of Environmental Conservation/R.E. Wright Environmental, Inc. | In Situ Bioventing Treatment System | 1 |
| Soil (Cont) | SVOCs (Cont) | Biological Degradation (Cont) | IT Corp. | Oxygen Microbubble In Situ Bioremediation | 2 |
| | | | Remediation Technologies, Inc. | Liquid and Solids Biological Treatment | 1 |
| | | Contaminant Survey Systems | Quadrel Services, Inc. | Emflux Soil-Gs Survey System | 3 |
| | | | W.L. Gore and Associates, Inc. | GORE-SORBER Screening Survey | 3 |
| | | Materials Handling | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical Thermal Desorption | Biotherm, LLC | Biotherm Process™ | 1 |
| | | | ELI Eco Logic, Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | | ELI Eco Logic, Inc. | Thermal Desorption Unit | 1 |
| | | | IIT Research Institute/Brown and Root Environmental | Radio Frequency Heating | 1 |
| | | | KAI Technologies, Inc./Brown and Root Environmental | Radio Frequency Heating | 1 |
| | | | Maxymillian Technologies, Inc. | Thermal Desorption System | 1 |
| | | | New Jersey Institute of Technology | GHEA Associates Process | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | NOVATERRA Associates | In-Situ Soil Treatments, (Steam/Air Stripping) | 1 |
| | | | IT Corporation | X*TAX™ Thermal Desorption | 1 |
| | | | Recycling Sciences International, Inc. | Desorption and Vapor Extraction System | 1 |
| | | | SIVE Services | Steam Injection and Vacuum Extraction | 1 |
| | | | Smith Environmental Technologies Corp. | Low Temperature Thermal Aeration(LTTA®) | 1 |
| | | | SoilTech ATP Systems, Inc. | Anaerobic Thermal Processors | 1 |
| Soil (Cont) | SVOCs (Cont) | Physical/Chemical Thermal Desorption (Cont) | Roy F. Weston, Inc. | Low Temperature Thermal Treatment (LT3™) System | 1 |
| | | Physical/Chemical Treatment | Arctic Foundations, Inc. | Cryogenic Barrier | 1 |
| | | | ARS Technologies, Inc. | Pneumatic Fracturing Extraction™ and Catalytic Oxidation | 1 |
| | | | Bergmann, a Division of Linatex, Inc. | Soil and Sediment Washing | 1 |
| | | | Center for Hazardous Materials Research | Organics Destruction and Metals Stabilization | 2 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | Electrokinetics, Inc. | Electrokinetic Soil Processing | 1 |
| | | | Energia, Inc. | Reductive Thermal and Photo-Thermal Oxidation Processes for Enhanced Conversation of Chlorocarbons | 2 |
| | | | High Voltage Environmental Applications, Inc. | High-Energy Electron Irradiation | 1 |
| | | | Hrubetz Environmental Services, Inc. | HRUBOUT® Process | 1 |
| | | | Ionics RCC | B.E.S.T. Solvent Extraction Technology | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | IT Corp. | Mixed Waste Treatment Process | 2 |
| | | | National Risk Management Research Laboratory | Base-Catalyzed Decomposition Process | 1 |
| | | | National Risk Management Research Laboratory | Volume Reduction Unit | 1 |
| | | | Terra-Kleen Response Group, Inc. | Solvent Extraction Treatment System | 1 |
| | | | Terra Vac, Inc. | In Situ and Ex Situ Vacuum Extraction | 1 |
| Soil (Cont) | SVOCs (Cont) | Physical/Chemical Treatment (Cont) | Toronto Harbor Commission | Soil Recycling | 1 |
| | | | Roy F. Weston, Inc./IEG Technologies | UVB - Vacuum Vaporizing Well | 1 |
| | | | Xerox Corp. | 2-PHASE™ Extraction Process | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | U.S. EPA | Field Analytical Screening Program - PCB Method | 3 |
| | | Samplers | Art's Manufacturing and Supply | AMS™ Dual-Tube Liner Soil Sampler | 3 |
| | | | Geoprobe Systems | Large Bore Soil Sampler | 3 |
| | | | Simulprobe Technologies, Inc. | Core Barrel Soil Sampler | 3 |
| | | Solidification/ Stabilization | Chemfix Technologies, Inc. | Solidification and Stabilization | 1 |
| | | | Geo-Con, Inc. | In Situ Solidification and Stabilization Process | 1 |
| | | | STC Remediation. A Division of Omega Environmental, Inc. | Organic Stabilization and Chemical Fixation/ Solidification | 1 |
| | | | WASTECH, Inc. | Solidification and Stabilization | 1 |
| | | | Western Product Recovery Group, Inc. | Coordinate, Chemical Bonding, and Adsorption Treatment | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Strategic Diagnostics, Inc. Corp. | RaPID Assay® | 3 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | Gas Technology Institute | Fluidized-Bed/Cyclonic Agglomerating Combustor | 2 |
| | | | Sonotech, Inc. | Frequency-Tunable Pulse Combustion System | 1 |
| Soil (Cont) | SVOCs (Cont) | Thermal Destruction (Cont) | Svedala Industries, Inc. | Pyrokiln Thermal Encapsulation Process | 2 |
| | | | Terra Therm, Inc. | In-Situ Thermal Destruction | |
| | | | Texaco, Inc. | Texaco Gasification Process | 1 |
| | | | U. of Dayton Research Institute | Photothermal Detoxification Unit | 2 |
| | | | Vortec Corp. | Vitrification Process | 1 |
| | | Other | Berkeley Environmental Restoration Center | In Situ Stream Enhanced Extraction Process | 1 |
| | VOCs | Biological Degradation | X-19 Biological Products | Microbial Degradation of PCBs | 1 |
| | | | Billings and Associates, Inc. | Subsurface Volatilization and Ventilation System (SVVS®) | 1 |
| | | | Bio-Rem, Inc. | Augmented In Situ Subsurface Bioremediation Process | 1 |
| | | | Ecova Corp. | Bioslurry Reactor | 1 |
| | | | Electrokinetics, Inc. | In situ Bioremediation by Electrokinetic Injection | 2 |
| | | | IT Corp. | Oxygen Microbubble in Situ Bioremediation | 2 |
| | | | National Risk Management Research Laboratory | Bioventing | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | New York State Dept. of Environment Conservation/ENSR Consulting and Larson Engineers | Ex Situ Biovault | 1 |
| | | | New York State Dept. of Environmental Conservation/R.E. Wright Environmental, Inc. | In Situ Bioventing Treatment System | 1 |
| Soil (Cont) | VOCs (Cont) | Biological Degradation (Cont) | New York State Dept. of Environmental Conservation/SBP Technologies, Inc. | Groundwater Circulation Biological Treatment Process | 1 |
| | | | New York State Dept. of Environmental Conservation/SBP Technologies, Inc. | Vacuum-Vaporized Well System | 1 |
| | | | Phytokinetics, Inc. | Phytoremediation of Contaminated Soils | 2 |
| | | | Phytokinetics, Inc. | Phytoremediation Process | 1 |
| | | Contaminant Survey Systems | Quadrel Services, Inc. | Emflux Soil-Gas Survey System | 3 |
| | | | W.L. Gore and Associates, Inc. | GORE-SORBER Screening Survey | 3 |
| | | Materials Handling | AEA Technology Environment | Soil Separation and Washing Process | 2 |
| | | | National Risk Management Research Laboratory. U. of Cincinnati and FREX, Inc. | Hydraulic Fracturing | 1 |
| | | | U.S. EPA | Excavation Techniques and Foam Suppression Methods | 1 |
| | | Physical/Chemical Thermal Desorption | Biotherm, LLC | Biotherm Process™ | 1 |
| | | | Current Environmental Solutions | Six Phase Heating at TCE | 1 |
| | | | Geokinetics International, Inc. | Electroheat-Enhanced Nonaqueous Phase Liquids Removal | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Hughes Environmental Systems, Inc. | Steam Enhanced Recovery Process | 1 |
| | | | IIT Research Institute/Brown and Root Environmental | Radio Frequency Heating | 1 |
| | | | Kai Technologies, Inc./Brown and Root Environmental | Radio Frequency Heating | 1 |
| Soil (Cont) | VOCs (Cont) | Physical/Chemical Thermal Desorption (Cont) | Maxymillian Technologies, Inc. | Thermal Desorption System | 1 |
| | | | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | | NOVATERRA Associates | In-Situ Soil Treatments, (Steam/Air Stripping) | 1 |
| | | | Praxis Environmental Technologies, Inc. | In Situ Thermally Enhanced Extraction (TEE) Process | 1 |
| | | | Recycling Sciences International, Inc. | Desorption and Vapor Extraction System | 1 |
| | | | SIVE Services | Steam Injection and Vacuum Extraction | 1 |
| | | | Smith Environmental Technologies Corp. | Low Temperature Thermal Aeration (LTTA®) | 1 |
| | | | SoilTech ATP Systems, Inc. | Anaerobic Thermal Processor | 1 |
| | | | Roy F. Weston, Inc. | Low Temperature Thermal Treatment (LT³®) System | 1 |
| | | Physical/Chemical Treatment | Arctic Foundations, Inc. | Cryogenic Barrier | 1 |
| | | | ARS Technologies, Inc. | Pneumatic Fracturing Extraction™ and Catalytic Oxidation | 1 |
| | | | Arizona State U./ Zentox Corp. | Photocatalytic Oxidation with Air Stripping | 2 |
| | | | AWD Technologies, Inc. | Aqua Detox®/SVE System | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Berkeley Environmental Restoration Center | In Situ Stream Enhanced Extraction Process | 1 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | Energia, Inc. | Reductive Photo-Dechlorination Treatment | 2 |
| Soil (Cont) | VOCs (Cont) | Physical/Chemical Treatment (Cont) | Energia, Inc. | Reductive Thermal and Photo-Thermal Oxidation Processes for Enhanced Conversion of Chlorocarbons | 2 |
| | | | Gas Technology Institute | Supercritical Extraction/Liquid Phase Oxidation | 2 |
| | | | High Voltage Environmental Applications, Inc. | High-Energy Electron Irradiation | 1 |
| | | | Hrubetz Environmental Services, Inc. | HRUBOUT® Process | 1 |
| | | | Ionics RCC | B.E.S.T. Solvent Extraction Technology | 1 |
| | | | IT Corp. | Batch Steam Distillation and Metals Extraction | 2 |
| | | | IT Corp. | ($KMnO_4$ (Potassium Permanganate) Oxidation of TCE) | 1 |
| | | | IT Corp. | Mixed Waste Treatment Process | 2 |
| | | | KSE, Inc. | Adsorption-Integrated-Reaction Process | 1/2 |
| | | | Morrison Knudsen Corp./Sptstamponazhgeologia Enterprises/STG Technologies | Clay-Base Grouting Technology | 1 |
| | | | National Risk Management Research Laboratory | Volume Reduction Unit | 1 |
| | | | Pulse Sciences, Inc. | X-Ray Treatment of Organically Contaminated Soils | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Radian International LLC | Integrated Vapor Extraction and Steam Vacuum Stripping and Soil Vapor Extraction/ Reinjection | 1 |
| | | | Terra-Kleen Response Group, Inc. | Solvent Extraction Treatment System | 1 |
| | | | Terra Vac, Inc. | In Situ and Ex Situ Vacuum Extraction | 1 |
| Soil (Cont) | VOCs (Cont) | Physical/Chemical Treatment (Cont) | Roy F. Weston, Inc./IEG Technologies | UVB - Vacuum Vaporizing Well | 1 |
| | | | Xerox Corp. | 2-PHASE™ EXTRACTION Process | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | HNU Systems, Inc. | HNU GC 311D Portable Gas Chromatograph | 3 |
| | | | Photovac Monitoring Instruments | PE Photovac Voyager Portable Gas Chromatograph | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | | U.S. EPA | Field Analytical Screening Program - PCB Method | 3 |
| | | Samplers | Clements, Inc. | JMC Environmentalist's Subsoil Probe | 3 |
| | | | Simulprobe Technologies, Inc. | Core Barrel Soil Sampler | 3 |
| | | Sensors | Dexsil Corporation | Emulsion Turbidimetry | 3 |
| | | | Fugro Geosciences, Inc. | Rapid Optical Screening Tool | 3 |
| | | | Geoprobe Systems | Geoprobe Conductivity System | 3 |
| | | Solidification/ Stabilization | Geo-Con, Inc. | In Situ Solidification and Stabilization Process | 1 |
| | | | WASTECH, Inc. | Solidification and Stabilization | 1 |
| | | | Western Product Recovery Group, Inc. | Coordinate, Chemical Bonding, and Absorption Treatment | 2 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Test Kits | Hanby Environmental Laboratory Procedure, Inc. | Test Kits for Organic Contaminants in Soil and Water | 3 |
| | | Thermal Destruction | Energy and Environmental Research Corp. | Hybrid Fluidized Bed System | 2 |
| | | | Gas Technology Institute | Fluidized-Bed/Cyclonic Agglomerating Combustor | 2 |
| Soil (Cont) | VOCs (Cont) | Thermal Destruction (Cont) | Sonotech, Inc. | Frequency-Tunable Pulse Combustion System | 1 |
| | | | Svedala Industries, Inc. | Pyrokiln Thermal Encapsulation Process | 2 |
| | | | Texaco, Inc. | Texaco Gasification Process | 1 |
| | | | Vortec Corp. | Vitrification Process | 1 |
| | Other | Cone Penetrometers | Tri-Services | Site Characterization Analysis Penetrometer System (SCAPS) | 3 |
| | | Samplers | ART's Manufacturing and Supply | Sediment Core Sampler | 3 |
| | | Solidification/ Stabilization | STC Remediation, a Division of Omega Environmental, Inc. | Organic Stabilization and Chemical Fixation/ Solidification | 1 |
| Solids | Dioxins | Physical/Chemical Treatment | Active Environmental Technologies, Inc. | TechXtract™ Process | 1 |
| | Furans | Physical/Chemical s Treatment | Active Environmental Technologies, Inc. | TechXtract™ Process | 1 |
| | Heavy Metals | Physical/Chemical Treatment | Active Environmental Technologies, Inc. | TechXtract™ Process | 1 |
| | | Solidification/ Stabilization | Gas Technology Institute | Cement-Lock Technology | 1 |
| | | Thermal Destruction | Gas Technology Institute | Cement-Lock Technology | 1 |
| | Inorganics | Solidification/ Stabilization | Gas Technology Institute | Cement-Lock Technology | 1 |
| | | Thermal Destruction | Gas Technology Institute | Cement-Lock Technology | 1 |
| | Metals | Physical/Chemical Treatment | Active Environmental Technologies, Inc. | TechXtract™ Process | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| Solids (Cont) | | Solidification/ Stabilization | Gas Technology Institute | Cement-Lock Technology | 1 |
| | | Thermal Destruction | Gas Technology Institute | Cement-Lock Technology | 1 |
| | Mercury | Physical/Chemical Treatment | Bionebraska, Inc. | BiMelyze® Mercury Immunoassay | 3 |
| | Organics | Solidification/ Stabilization | Gas Technology Institute | Cement-Lock Technology | 1 |
| | | Thermal Destruction | Gas Technology Institute | Cement-Lock Technology | 1 |
| | PCBs | Physical/Chemical Treatment | Active Environmental Technologies, Inc. | TechXtract™ Process | 1 |
| | | | Active Environmental Technologies, Inc. | TechXtract™ Process | 1 |
| | | Solidification/ Stabilization | Gas Technology Institute | Cement-Lock Technology | 1 |
| | | Thermal Destruction | Gas Technology Institute | Cement-Lock Technology | 1 |
| | Pesticides | Physical/Chemical Treatment | Active Environmental, Inc. | TechXtract™ Process | 1 |
| | Radionuclides | Physical/Chemical Treatment | Active Environmental Technologies, Inc. | Tech Xtract Decontamination Process | 1 |
| | Other | Solidification/ Stabilization | U.S. EPA NRMRL | Alternative Cover Assessment Program | 1 |
| Waste Water | Aromatic VOCs | Biological Degradation | Biotrol® | Biological Aqueous Treatment System | 1 |
| | | | Electrokinetics, Inc. | In Situ Bioremediation by Electrokinetic Injection | 2 |
| | | | ZENON Environmental, Inc. | ZenoGem™ Process | 1 |
| | | Physical/Chemical Thermal Desorption | Rochem Separation Systems, Inc. | Rochem Disc Tube™ Module System | 1 |
| | | Physical/Chemical Treatment | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Beam Irradiation | 2 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Irradiation | 1 |
| Waste water (Cont) | Aromatic VOCs (Cont) | Physical/Chemical Treatment (Cont) | Magnum Water Technology | CAV-OX® Process | 1 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Water Treatment | 1/2 |
| | | | Pulse Sciences, Inc. | X-Ray Treatment of Aqueous Solutions | 2 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | | ZENON Environmental Inc. | Cross Flow Pervaporation System | 1 |
| | | Portable Gas Chromatographs | Analytical and Remedial Technology, Inc. | Automated Sampling and Analytical Platform | 3 |
| | | | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | HNU Systems, Inc. | HNU GC 311D Portable Gas Chromatograph | 3 |
| | | | Sentex Sensing Technology, Inc. | Scentograph Plus II Portable Gas Chromatograph | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | | U.S. EPA | Field Analytical Screening Program - PCB Method | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Hanby Environmental Laboratory Procedure, Inc. | Test Kits for Organic Contaminants in Soil and Water | 3 |
| | Cyanide | Biological Degradation | Pintail Systems, Inc. | Spent Ore Bioremediation Process | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | Diesel | Spectrometer | SiteLAB Corporation | Ultraviolet Fluorescence Spectroscopy | 3 |
| | Dioxins | Physical/Chemical Thermal Desorption | ELI Eco Logic Inc. | Gas-Phase Chemical Reduction Process | 1 |
| Waste water (Cont) | Dioxins (Cont) | Physical/Chemical Treatment | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Irradiation | 1 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Water Treatment | 1/2 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | Explosives | Physical/Chemical Thermal Desorption | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | Physical/Chemical Treatment | U.S. Filter/WTS ULtrox | Ultraviolet Radiation and Oxidation | 1 |
| | | Solidification/ Stabilization | Retech, Inc. | Plasma Heat | 1 |
| | Furans | Physical/Chemical Thermal Desorption | ELI Eco Logic Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | Physical/Chemical Treatment | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Irradiation | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Matrix Photocatalytic | Photocatalytic Water Treatment | 1/2 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| Waste water (Cont) | Furans (Cont) | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | Gasoline | Spectrometer | SiteLAB Corporation | Ultraviolet Fluorescence Spectroscopy | 3 |
| | Halogenated VOCs | Biological Degradation | Biotrol® | Biological Aqueous Treatment System | 1 |
| | | | ZENON Environmental, Inc. | ZenoGem™ Process | 1 |
| | | Physical/Chemical Thermal Desorption | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | Physical/Chemical Treatment | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | EnviroMetal Technologies, Inc. | In Situ and Ex Situ Metal Enhanced Abiotic Degradation of Dissolved Halogenated Organic Compounds in Groundwater | 1 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Beam Irradiation | 2 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Irradiation | 1 |
| | | | Magnum Water Technology | CAV-OX® Process | 1 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Water Treatment | 1/2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Pulse Sciences, Inc. | X-Ray Treatment of Aqueous Solutions | 2 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| Waste water (Cont) | Halogenated VOCs (Cont) | Physical/Chemical Treatment (Cont) | U.S. Filter/WTS Ultrox | Ultraviolet Radiation and Oxidation | 1 |
| | | | UV Technologies, Inc. | PhotoCAT™ Process | 2 |
| | | | Roy F. Weston, Inc. | Ambersorb™ 563 Absorbent | 2 |
| | | | ZENON Environmental Inc. | Cross Flow Pervaporation System | 1 |
| | | Portable Gas Chromatographs | Analytical and Remedial Technology, Inc. | Automated Sampling and Analytical Platform | 3 |
| | | | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | Sentex Sensing Technology, Inc. | Scentograph Plus II Portable Gas Chromatograph | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | | U.S. EPA | Field Analytical Screening Program - PCB Method | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Thermal Destruction | Energy and Environmental Research Corp. | Hybrid Fluidized Bed System | 2 |
| | Heavy Metals | Field Portable X-Ray Fluorescence | HNU Systems, Inc. | HNU Source Excited Fluorescence analyzer-Portable (SEFA-P) X-Ray Fluorescence Analyzer | 3 |
| | | Portable Gas Chromatograph | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | Heavy Minerals | Solidification/ Stabilization | Retech, Inc. | Plasma Heat | 1 |
| | Herbicides | Biological Degradation | Biotrol® | Biological Aqueous Treatment System | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Electrokinetics, Inc. | In Situ Bioremediation by Electrokinetic Injection | 2 |
| Waste water (Cont) | Herbicides (Cont) | Biological Degradation (Cont) | ZENON Environmental, Inc. | ZenoGem™ Process | 1 |
| | | Physical/Chemical Thermal Desorption | ELI ECO Logic Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | Physical/Chemical Treatment | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | Geokinetics International, Inc. | Electrokinetics for NSFO Mobilization | 1 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Irradiation | 1 |
| | | | Magnum Water Technology | CAV-OX® Process | 1 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Water Treatment | 1/2 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Strategic Diagnostics, Inc. | RaPID Assay® | 3 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | Inorganics | Field Portable X-Ray Fluorescence | HNU Systems, Inc. | HNU Source Excited Fluorescence Analyzer-Portable (SEFA-P) X-Ray Fluorescence Analyzer | 3 |
| | | Solidification/ Stabilization | Retech, Inc. | Plasma Heat | 1 |
| | Mercury | Solidification/ Stabilization | Retech, Inc. | Plasma Heat | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| Waste water (Cont) | Metals | Biological Degradation | Colorado Dept. of Public Health and Environmental | Constructed Wetlands-Based Treatment | 1 |
| | | | Pintail Systems, Inc. | Biomineralization of Metals | 2 |
| | | | Pintail Systems, Inc. | Spent Ore Bioremediation Process | 1 |
| | | Field Portable X-Ray Fluorescence | HNU Systems, Inc. | HNU Source Excited Fluorescence Analyzer-Portable (SEFA-P) X-Ray Fluorescence Analyzer | 3 |
| | | | Metorex, Inc. | Field Portable X-Ray Fluorescence Analysis | 3 |
| | | Physical/Chemical Radioactive Waste Treatment | Filter Flow Technology, Inc. | Colloid Polishing Filter Method | 1 |
| | | Physical/Chemical Thermal Desorption | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | | Rochem Separation Systems, Inc. | Rochem Disc Tube™ Module System | 1 |
| | | Physical/Chemical Treatment | Atomic Energy of Canada, Limited | Chemical Treatment and Ultrafiltration | 2 |
| | | | Atomic Energy of Canada, Limited | Ultrasonic-Aided Leachate Treatment | 2 |
| | | | E.I. DuPont De Nemours and Company, and Oberlin Filter Co. | Membrane Microfiltration | 1 |
| | | | Dynaphore, Inc. | FORAGER® Sponge | 1 |
| | | | EnviroMetal Technologies, Inc. | Reactive Barrier | 1 |
| | | | EPOC Water, Inc. | Precipitation Microfiltration, and Sludge Dewatering | 1 |
| | | | General Environmental Corporation | CURE® Electrocoagulation Wastewater Treatment System | 1 |
| | | | Lewis Environmental Services, Inc./ Hickson Corp. | Chromated Copper Arsenic Soil Leaching Process | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| Waste water (Cont) | Metals (Cont) | Physical/Chemical Treatment (Cont) | Matrix Photocatalytic Inc. | Photocatalytic Water Treatment | 1/2 |
| | | | Morrison Knudsen Corporation/Spetstamponazhgeologia Enterprises/STG Technologies | Clay-Base Grouting Technology | 1 |
| | | | RECRA Environmental, Inc. | Alternating Current Electrocoagulation Technology | 2 |
| | | | Region 8 and State of Colorado | Multiple Innovative Passive Mine Drainage Technologies | 1 |
| | | | Selentec Environmental, Inc. | Selentec MAG*SEP Technology | 1 |
| | | | U. of Washington | Adsorptive Filtration | 2 |
| | | Portable Gas Chromatographs | HNU Systems, Inc. | HNU GC 311D Portable Gas Chromatograph | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | Energy and Environmental Research Corp. | Hybrid Fluidized Bed System | 2 |
| | Organic | Physical/Chemical Treatment | Geokinetics International, Inc. | Electrokinetics for NSFO Mobilization | 1 |
| | | Solidification/ Stabilization | Retech, Inc. | Plasma Heat | 1 |
| | PAHs | Physical/Chemical Treatment | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | Spectrometer | SiteLAB Corporation | Ultraviolet Fluorescence Spectroscopy | 3 |
| | PCBs | Biological Degradation | ZENON Environmental, Inc. | ZenoGem™ Process | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| Waste water (Cont) | PCBs (Cont) | Field Portable X-Ray Fluorescence | Metorex, Inc. | Field Portable X-Ray Fluorescence Analysis | 3 |
| | | Physical/Chemical Thermal Desorption | ELI Eco Logic Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | Physical/Chemical Treatment | Calgon Carbon Oxidation Technologies | **perox-pure**™ Chemical Oxidation Technology | 1 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Beam Irradiation | 2 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Irradiation | 1 |
| | | | Magnum Water Technology | CAV-OX® Process | 1 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Water Treatment | 1/2 |
| | | | Morrison Knudsen Corporation/Spetstam ponazhgeologia Enterprises/STG Technologies | Clay-Base Grouting Technology | 1 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | | U.S. Filter/WTS Ultrox | Ultraviolet Radiation and Oxidation | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | HNU Systems, Inc. | HNU Source Excited Fluorescence Analyzer-Portable (SEFA-P) X-Ray Fluorescence Analyzer | 3 |
| | | | Sentex Sensing Technology, Inc. | Scentograph Plus II Portable Gas Chromatograph | 3 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| Waste water (Cont) | PCBs (Cont) | Portable Gas Chromatographs (Cont) | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | | U.S. EPA | Field Analytical Screening Program - PCB Method | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |
| | | Spectrometers | Graseby Ionics, ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Strategic Diagnostics, Inc. | Ensys Penta Test System | 3 |
| | | | Hanby Environmental Laboratory Procedure, Inc. | Test Kits for Organic Contaminants in Soil and Water | 3 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | Energy and Environmental Research corp. | Hybrid Fluidized Bed System | 2 |
| | PCP | Physical/Chemical Treatment | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | | U.S. Filter/WTS Ultrox | Ultraviolet Radiation and Oxidation | 1 |
| | | Test Kits | Strategic Diagnostics, Inc. | Ensys Penta Test System | 3 |
| | | | Strategic Diagnostics, Inc. | EnviroGard™ PCP Immunoassay Test Kit | 3 |
| | | | Strategic Diagnostics, Inc. | RaPID Assay® | 3 |
| | Pesticides | Biological Degradation | Biotrol® | Biological Aqueous Treatment System | 1 |
| | | | Electrokinetics, Inc. | In Situ Bioremediation by Electrokinetic Injection | 2 |
| | | | ZENON Environmental, Inc. | ZenoGem™ Process | 1 |
| | | Physical/Chemical Thermal Desorption | ELI Eco Logic Inc. | Gas-Phase Chemical Reduction Process | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| Waste water (Cont) | Pesticides (Cont) | Physical/Chemical Treatment | Calgon Carbon Oxidation Technologies | perox-pure™ Chemical Oxidation Technology | 1 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Beam Irradiation | 2 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Irradiation | 1 |
| | | | Magnum Water Technology | CAV-OX® Process | 1 |
| | | | Matrix Photocatalytic Inc. | Photocatalytic Water Treatment | 1/2 |
| | | | Morrison Knudsen Corporation/Spetstam ponazhgeolo Enterprises/STG Technologies | Clay-Base Grouting Technology | 1 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | | U.S. Filter/WTS Ultrox | Ultraviolet Radiation and Oxidation | 1 |
| | | Portable Gas Chromatographs | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | Sentex Sensing Technology, Inc. | Scentograph Plus II Portable Gas Chromatograph | 3 |
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | | U.S. EPA | Field Analytical Screening Program-PCB Method | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER™ Technology | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| Waste water (Cont) | Pesticides (Cont) | Test Kits | Hanby Environmental Laboratory Procedure, Inc. | Test Kits for Organic Contaminants in Soil and Water | 3 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | Strategic Diagnostics, Inc. | Ensys Penta Test System | 3 |
| | | | Strategic Diagnostics, Inc. Corp. | RaPID Assay® | 3 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | | | Energy and Environmental Research Corp. | Hybrid Fluidized Bed System | 2 |
| | Petroleum Hydrocarbons | Physical/Chemical Thermal Desorption | New Jersey institute of Technology | GHEA Associates Process | 2 |
| | | Physical/Chemical Treatment | Calgon Carbon Oxidation Technologies | perox-pure™ Chemical Oxidation Technology | 1 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | Portable Gas Chromatographs | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | Spectrometer | Horiba Instruments, Inc. | Infrared Analysis | 3 |
| | | | SiteLAB Corporation | Ultraviolet Fluorescence Spectroscopy | 3 |
| | | | Wilks Enterprise, Inc. | Infrared Analysis | 3 |
| | | Test Kits | Idetek, Inc. | Equate® Immunoassay | 3 |
| | Radionuclides | Physical/Chemical Radioactive Waste Treatments | Filter Flow Technology, Inc. | Colloid Polishing Filter Method | 1 |
| | | Physical/Chemical Treatment | Atomic Energy of Canada, Limited | Chemical Treatment and Ultrafiltration | 2 |
| | | | Atomic Energy of Canada, Limited | Ultrasonic-Aided Leachate Treatment | 2 |
| Waste water (Cont) | Radionuclides (Cont) | Physical/Chemical Treatment (Cont) | Selentec Environmental, Inc. | Selentec MAG*SEP Technology | 1 |
| | | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | SVOCs | Biological Degradation | Biotrol® | Biological Aqueous Treatment System | 1 |
| | | | ZENON Environmental, Inc. | ZenoGem™ Process | 1 |
| | | Physical/Chemical Thermal Desorption | ELI Eco Logic Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | Physical/Chemical Treatment | Calgon Carbon Oxidation Technologies | perox-pure™ Chemical Oxidation Technology | 1 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | Portable Gas Chromatographs | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | Spectrometer | Horiba Instruments, Inc. | Infrared Analysis | 3 |
| | | | SiteLAB Corporation | Ultraviolet Fluorescence Spectroscopy | 3 |
| | | | Wilks Enterprise, Inc. | Infrared Analysis | 3 |
| | | Test Kits | Idetek, Inc. | Equate® Immunoassay | 3 |
| | Radionuclides | Physical/Chemical Radioactive Waste Treatments | Filter Flow Technology, Inc. | Colloid Polishing Filter Method | 1 |
| | | Physical/Chemical Treatment | Atomic Energy of Canada, Limited | Chemical Treatment and Ultrafiltration | 2 |
| | | | Atomic Energy of Canada, Limited | Ultrasonic-Aided Leachate Treatment | 2 |
| | | | Selentec Environmental, Inc. | Selentec MAG*SEP Technology | 1 |
| Waste water (Cont) | Radionuclides (Cont) | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1/2 |
| | SVOCs | Biological Degradation | Biotrol® | Biological Aqueous Treatment System | 1 |
| | | | ZENON Environmental, Inc. | ZenoGem™ Process | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Physical/Chemical Thermal Desorption | ELI Eco Logic Inc. | Gas-Phase Chemical Reduction Process | 1 |
| | | | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | Physical/Chemical Treatment | Calgon Carbon Oxidation Technologies | perox-pure™ Chemical Oxidation Technology | 1 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Beam Irradiation | 2 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Irradiation | 1 |
| | | | Pulse Sciences, Inc. | X-Ray Treatment of Aqueous Solutions | 2 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | Portable Gas Chromatographs | Analytical and Remedial Technology, Inc. | Automated Sampling and Analytical Platform | 3 |
| | | | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | U.S. EPA | Field Analytical Screening Program - PCB Method | 3 |
| | | Solidification/ Stabilization | Wheelaborator Clean Air Systems, Inc. | PO*WW*ER Technology | 1 |
| | | Test Kits | Strategic Diagnostics, Inc., Corp. | RaPID Assay® | 3 |
| Waste water (Cont) | SVOCs (Cont) | Thermal Destruction | BWX Technologies, Inc. | Cyclone Furnace | 1 |
| | VOCs | Biological Degradation | Biotrol® | Biological Aqueous Treatment System | 1 |
| | | | Electrokinetics, Inc. | In Situ Bioremediation by Electrokinetic Injection | 2 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | ZENON Environmental, Inc. | ZenoGem™ Process | 1 |
| | | Physical/Chemical Thermal Desorption | New Jersey Institute of Technology | GHEA Associates Process | 2 |
| | | | Rochem Separation Systems, Inc. | Rochem Disc Tube™ Module System | 1 |
| | | Physical/Chemical Treatment | Calgon Carbon Oxidation Technologies | perox-pure™ Chemical Oxidation Technology | 1 |
| | | | CF Systems Corp. | Liquified Gas Solvent Extraction (LG-SX) Technology | 1 |
| | | | EnviroMetal Technologies, Inc. | In Situ and Ex Situ metal Enhanced Abiotic Degradation of Dissolved Halogenated Organic Compounds in Groundwater | 1 |
| | | | EnviroMetal Technologies, Inc. | Reactive Barrier | 1 |
| | | | High Voltage Environmental Applications, Inc. | High Energy Electron Irradiation | 1 |
| | | | Pulse Sciences, Inc. | X-Ray Treatment of Aqueous Solutions | 2 |
| | | | SBP Technologies, Inc. | Membrane Filtration and Bioremediation | 1 |
| | | | U.S. Filter/WTS Ultrox | Ultraviolet Radiation and Oxidation | 1 |
| | | | UV Technologies, Inc. | PhotoCAT™ Process | 2 |
| | | | Roy F. Weston,, Inc. | Ambersorb™ 563 Absorbent | 2 |
| | | | ZENON Environmental Inc. | Cross Flow Pervaporation System | 1 |
| Waste water (Cont) | VOCs (Cont) | Portable Gas Chromatograph | Bruker Analytical Systems, Inc. | Mobile Environmental Monitor | 3 |
| | | | HNU Systems, Inc. | HNU Source Excited Fluorescence Analyzer-Portable (SEFA-P) X-Ray Fluorescence Analyzer | 3 |
| | | | Sentex Sensing Technology, Inc. | Scentograph Plus II Portable Gas Chromatograph | 3 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | SRI Instruments | Compact Gas Chromatograph | 3 |
| | | | U.S. EPA | Field Analytical Screening Program - PCB Method | 3 |
| | | Solidification/ Stabilization | Wheelabrator Clean Air Systems, Inc. | PO*WW*ER Technology | 1 |
| | | Spectrometers | Graseby Ionics, Ltd., and PCP, Inc. | Ion Mobility Spectrometry | 3 |
| | | Test Kits | Hanby Environmental Laboratory Procedure, Inc. | Test Kits for Organic Contaminants in Soil and Water | 3 |
| | | Thermal Destruction | Energy and Environmental Research Corp. | Hybrid Fluidized Bed System | 2 |
| | Other | Biological Degradation | EcoMat, Inc. | Biological Denitrificaiton Process | |
| | | Physical/Chemical Treatment | North American Technologies, Group, Inc. | Oleophilic Amine-Coated Ceramic Chip | 1 |
| | | | RECRA Environmental, Inc. | Alternating Current Electrocoagulation Technology | 2 |
| Other | Aromatic VOCs | Solidification/ Stabilization | Western Product Recovery Group, Inc. | Coordinate, Chemical Bonding, and Adsorption Treatment | 2 |
| | Dioxins | Physical/Chemical Treatment | Terra-Kleen Response Group, Inc. | Solvent Extraction Treatment System | 1 |
| | | Solidification/ Stabilization | Geosafe Corp. | GeoMelt Vitrification | 1 |
| | Furans | Physical/Chemical Treatment | Terra-Kleen Response Group, Inc. | Solvent Extraction Treatment System | 1 |
| Other (Cont) | Furans (Cont) | Solidification/ Stabilization | Geosafe Corp. | GeoMelt Vitrification | 1 |
| | Halogenated VOCs | Physical/Chemical Treatment | Process Technologies, Inc. | Photolytic Destruction of Vapor-phase Halogens | 1 |
| | | Solidification/ Stabilization | Geosafe Corp. | GeoMelt Vitrification | 1 |
| | Metals | Field Portable X-Ray Fluorescence | NITON Corp. | XL Spectrum Analyzer | 3 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | | TN Spectrace | 9000 X-Ray Fluorescence Analyzer and Lead X-Ray Fluorescence Analyzer | 3 |
| | | Materials Handling | AEA Technology Environment | Soil Separation and Washing Process | 2 |
| | | Solidification/ Stabilization | Geosafe Corp. | GeoMelt Vitrification | 1 |
| | | | Western Product Recovery Group, Inc. | Coordinate, Chemical bonding, and Adsorption Treatment | 2 |
| | | Thermal Destruction | Concurrent Technologies | Smelting Lead-Containing Wastes | 2 |
| | PCBs | Physical/Chemical Treatment | Terra-Kleen Response Group, Inc. | Solvent Extraction Treatment System | 1 |
| | | Solidification/ Stabilization | Geosafe Corp. | GeoMelt Vitrification | 1 |
| | Pesticides | Physical/Chemical Treatment | Terra-Kleen Response Group, Inc. | Solvent Extraction Treatment System | 1 |
| | | Solidification/ Stabilization | Geosafe Corp. | GeoMelt Vitrification | 1 |
| | SVOCs | Physical/Chemical Thermal Desorption | Process Technologies, Inc. | Photolytic Destruction of Vapor-Phase Halogens | 1 |
| | | Physical/Chemical Treatment | Terra-Kleen Response Group, Inc. | Solvent Extraction Treatment System | 1 |
| | | Solidification/ Stabilization | Western Product Recovery Group, Inc. | Coordinate, Chemical Bonding, and Adsorption Treatment | 2 |
| | VOCs | Materials Handling | AEA Technology Environment | Soil Separation and Washing Process | 2 |
| Other (Cont) | VOCs (Cont) | Physical/Chemical Thermal Desorption | Process Technologies, Inc. | Photolytic Destruction of Vapor-Phase Halogens | 1 |
| | | Physical/Chemical Treatment | Terra-Kleen Response Group, Inc. | Solvent Extraction Treatment System | 1 |
| | | Solidification/ Stabilization | Western Product Recovery Group, Inc. | Coordinate, Chemical Bonding, and Adsorption Treatment | 2 |
| | Not Applicable | Capping/ Containment | Wilder Construction Co. | Matcon Modified Asphalt Cap. | 1 |

## APPLICABILITY INDEX (CONTINUED)

| Media | Contaminants | Treatment Type | Technology Vendor | Technology | Volume |
|---|---|---|---|---|---|
| | | Containment Survey Systems | Earthsoft | Equis Environmental Data Management System | 1 |
| | | Data Management Systems | Earthsoft | Equis Environmental Data Management System | 1 |
| | | | GIS/Solutions, Inc. | GIA/Key™ Environmental Data Management System | 1 |